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The Journal

of the

Southern Appalachian Botanical Club

Volume 16 June, 1951 No. 2

Vascular Plants Previously Unreported from Georgia*

ROBERT F. THORNE

A survey of the vascular plants of southwestern Georgia was made by the writer during the summer of 1946, throughout the growing season of 1947, and on subsequent collecting trips in 1948 and 1949. Similar surveys of other groups of plants and animals have been made or are being made by the personnel of the Emory University Field Station, Newton, Georgia, to furnish more adequate information on a part of Georgia hitherto largely neglected by the biologists. A previous paper (Thorne, 1949a), also based on work done at the Field Station from 1946 to 1948, presented information on the occurrence of inland plants on the Gulf Coastal Plain of Georgia. Papers by Harper (1900-1906) first called attention to the rich and varied flora of the Georgia Coastal Plain, and more recent papers by Wright and Wright (1932), Eyles (1941), Duncan (1941-1950), and Cronquist (1949) have added considerably to our knowledge of the flora of southern Georgia.

During the period in which the survey was undertaken much herbarium material was collected, which subsequently has been distributed to various herbaria in the United States and Canada. Extensive field observations were made, and over twenty thousand miles were travelled in the area surveyed. As might be expected in an area largely overlooked by botanists, southwestern Georgia has

*Contribution based upon field work done in southern Georgia under the joint auspices of the Emory University Field Station, Newton, Georgia and Cornell University, Ithaca, New York. The writer wishes to acknowledge his indebtedness to Major M. H. Goodwin, Jr., Director of the Emory University Field Station, and Professor W. C. Muenscher of Cornell University for their help and advice during this study. The writer also wishes to thank Professor Muenscher and Professor W. H. Duncan, of the University of Georgia, for reading the manuscript and offering valuable suggestions.

recently yielded many botanical novelties, including several new species, more than one hundred vascular plants previously unreported from Georgia, and several hundred species of considerable interest because of their rarity, limited area, or presence well beyond the reported limits of their geographical range. Over 1730 species of vascular plants growing without cultivation are now known to occur in the southwestern corner of the state (Thorne, 1949b).

This paper will be confined mostly to a discussion of the many species of vascular plants apparently not previously reported from the state of Georgia. For all these plants the latest information available on their known distribution was sought in the pertinent manuals, monographs, and papers and notes on distribution. In the recently published (1950) eighth edition of *Gray's Manual of Botany*, three species treated here, *Scirpus hallii* A. Gray, *Polygala nuttallii* T. & G., and *Ipomoea lacunosa* L. are definitely reported from Georgia by Fernald. Ranges given for several other species could be construed to include Georgia.

Nearly all the writer's collections cited are deposited in the Wiegand Herbarium at Cornell University, Ithaca, New York; consequently, the locations of the writer's individual specimens are not given in the citations. Duplicates of many are deposited in the herbaria of the Emory University Field Station, Newton, Georgia, University of Georgia, Athens, Georgia, State University of Iowa, Iowa City, Iowa, Gray Herbarium, Cambridge, Massachusetts, Institut Botanique, Montreal, Canada, United States National Museum Washington, D. C., and in several other herbaria. Unless otherwise specified, collections cited other than the writer's are all deposited in the Herbarium of the University of Georgia. These citations were kindly supplied by Dr. W. H. Duncan of that university.

The stations cited for each species are listed by counties, which are italicized. Unless a collector's name precedes the collection number, the collection was made by the writer, sometimes in the company of others. Professor W. C. Muenscher of Cornell University spent much time in the field with the writer, the joint collections being included in the following numbers: 2304-3155, 7676-9358. Dr. W. H. Duncan, Dr. R. M. Harper, Dr. S. J. Smith, Mr. C. H. Ford, Major M. H. Goodwin, Jr., and Mr. R. A. Norris also collected with the writer. Citations without collector and collection number represent observations only. The frequency terms used in this paper are arbitrary and based on the following scale:

rare	— 3 or fewer stations,
infrequent	— 4-9 stations,
frequent	—10-19 stations,
common	—20 or more stations.

Where the name of a species used here is different from that used in J. K. Small's *Manual of the Southeastern Flora* (1933), the name used by Small is included in parentheses. The species and genera are arranged alphabetically within families, and the families are arranged largely according to Engler. Those species apparently unreported from Georgia previous to the survey are preceded by an asterisk.

POLYPODIACEAE

*THELYPTERIS DENTATA (Forsk.) E. St. John is infrequent in moist, rich woods in southern Georgia. *Early:* near Sowhatchee Creek west of Saffold, *7117*, Oct. 8, 1947. *Miller:* along Spring Creek west of Colquitt, *5433*, July 18, 1947. *Terrell:* near stream 4 miles northeast of Bronwood, *Pyron and McVaugh 2002*, Oct. 23, 1937. *Thomas:* along the Ochlocknee River near Thomasville, *D. S. Correll 6497*, Aug. 15, 1936.

ZOSTERACEAE

*POTAMOGETON ILLINOENSIS Morong (*P. angustifolius* and *P. lucens* of American authors) is infrequent in shallow water of ponds and sluggish streams in southern Georgia. *Baker:* Big Cypress Creek 2 miles west of the Field Station, *1563*, July 17, 1946; Ivy's Mill Pond, *4046*, May 20, 1947. *Camden:* roadside borrow-pit near Colesburg, *2121*, *2135*, Sept. 4, 1946. *Decatur:* Cane Water Pond, *8620*, Aug. 27, 1948. *Early:* borrow-pits in woods near Kirkland Creek southeast of Saffold, *1770*, July 28, 1946, *6686*, Sept. 16, 1947. *Lee:* Coney Lake, *8319*, Aug. 21, 1948.

POTAMOGETON NODOSUS Poir. (*P. americanus* C. and S.), unreported from Georgia by Ogden (1943), is rare on the Gulf Coastal Plain, and has been collected by the writer only once in southern Georgia and once in western Florida (Wakulla Springs). *Dougherty:* clear, swift stream flowing from Radium Springs near the Flint River, 4 miles south of Albany, *6082*, Aug. 14, 1947; *9195*, Mar. 26, 1959. *Gordon*: edge of Dew's Pond and outlet stream, *Donald Scott 69*, July 7, 1949.

*POTAMOGETON PUSILLUS L. (*P. panormitanus* Biv.) is mapped by Muenscher (1944) for the Southeast only in Alabama. *Early:* shallow water of Mill Creek just below the dam at Sheffield Mill, *4053*, May 20, 1947; *9140*, Mar. 24, 1949.

NAJADACEAE

*NAJAS CONFERTA A. Br., previously believed to occur in the United States only in Florida, was found north of the Florida state line in three limesink ponds in *Decatur* County: Cane Water Pond, *5538*, June 21, 1947; *8612a*, Aug. 27, 1948; Open Pond, *5537*, June 21, 1947; *6552*, Sept. 9. 1947; *8637a*, Aug. 27, 1948; Douglas Lake.

ALISMATACEAE

*ECHINODORUS ROSTRATUS (Nutt.) Engelm. (*E. cordifolius* of authors) is largely a plant of the lower Mississippi Valley. It is even more rare in southwestern Georgia than its two congeners, *E. cordifolius* (L.) Griseb. (*E. radicans* (Nutt.) Engelm.) and *E. tenellus* (Mart.) Buch. The writer collected it in shallow water and wet mud only along Big Cypress Creek, 2 miles west of Emory University Field Station, *Baker* County, *1562*, July 17, 1946; *1791*, Aug. 3, 1946; *6499*, Sept. 3, 1947.

GRAMINEAE

*DIGITARIA VIOLASCENS Link. is a tropical weed reported by Hitchcock (1935) only from Arkansas and Texas in the United States. The writer found it once in waste ground in Colquitt, *Miller* County, *4407*, June 3, 1947.

*ERAGROSTIS GLOMERATA (Walt.) L. H. Dewey is frequent on the banks of the Chattahoochee River in southwestern Georgia. *Early:* mouth of Sowhatchee Creek, *7111*, Oct. 8, 1947; Gilbert's Landing, *7292*, Oct. 17, 1947; mouth of Coheelee Creek, *7426*, Oct. 29, 1947. *Seminole*: Butler's Landing, *5656*, July 25, 1947; near Neal's Landing bridge, *7169*, Oct. 10, 1947.

*PANICUM AMARULUM Hitchc. and Chase, a perennial of sandy dunes and beaches, was found frequently with *P. amarum* Ell., on the coastal dunes of *Glynn* County: East Beach, St. Simon's Island, *2181*, Sept. 5, 1946; Jekyll Island, *8854*, Sept. 3, 1948.

*PANICUM CAERULESCENS Hack. is rare in wet, open places. *Baker:* near Mossy Pond, *3818*, May 12, 1947. *Lee:* near Fox Pond, *9188*, Mar. 25, 1949.

*PANICUM CHRYSOPIDIFOLIUM Nash, was collected once in sandy pinelands near Fox Pond, *Lee* County, *9187*, Mar. 25, 1949.

*PANICUM EQUILATERALE Scribn. was found in a dune hammock on Jekyll Island, *Glynn* County, *8889*, Sept. 3, 1948.

*PANICULUM OVALE Ell. was collected in dry, sandy woods 2 miles south of Hilton, *Early* County, *3609*, May 2, 1947.

*PANICUM SPRETUM Schult. in southern Georgia is infrequent in shallow water of wet pinelands and cypress ponds. *Baker:* margin of Mossy Pond, *3812*, May 12, 1947. *DeKalb:* Stone Mountain, *Venard 681*, Oct. 4, 1947. *Dougherty:* 2 miles west of Pretoria, *3969*, May 17, 1947. *Miller:* 2 miles west of Colquitt, *3410b*, April 28, 1947; Willis-Cooke Lake, *5225*, July 8, 1947. *Toombs:* swamp of Pendleton Creek south of Ohoope, *Eyles 6985*, May 15, 1940.

Among forty-five other species of *Panicum* collected by the writer in southwestern Georgia is one aquatic species that seems to be undescribed and two species, PANICUM CURTIFOLIUM Nash and P. POLYCAULON Nash, which were reported for the first time from Georgia by Eyles in 1941. *P. CONDENSUM Nash, if treated as distinct from *P. agrostoides* Spreng., should be credited to Georgia. The writer, however, is unable to consider it more than a variation of *P. agrostoides*.

*SETARIA CORRUGATA (Ell.) Schult. is infrequent in sandy woods and on banks of streams. *Baker:* near the Field Station, *6645*, Sept, 15, 1947. *Decatur:* near Open Pond, *6569*, Sept. 9, 1947; near Cane Water Pond, *8630*, Aug. 27, 1948. *Early:* bank of the Chattahoochee River west of Saffold, *8561*, Aug. 25, 1948. *Seminole:* near Neal's Landing bridge, *7181*, Oct. 10, 1947.

*UNIOLA NITIDA Baldw., reported only from Florida and South Carolina by Small (1933), is infrequent in open pinelands and along streams. *Baker*: 1 mile northeast of Newton, *5057*, June 28, 1947. *Calhoun:* 5 miles east of Arlington. *Miller:* along Cypress Creek 6 miles northwest of Colquitt, *7546*, Nov. 8, 1947; 3 miles west of Colquitt, *6402*, Aug. 27, 1947.

CYPERACEAE

*CAREX DECOMPOSITA Muhl. is rare in shallow water and on floating logs of pond margins. *Baker:* Mossy Pond, *1550*, July 16, 1946; *3536*, May 5, 1947; *9045*, Mar. 21, 1949; margin of Ivy's Mill Pond, *4049*, May 20, 1947.

*CAREX OLIGOCARPA Schk. is rare in rich woods. *Decatur:* ravines in bluff east of Flint River, 1 mile north of Chattahoochee, Florida, *3100*, Apr. 14, 1947. *Early:* bluff along Chattahoochee River west of Hilton, *3866*, May 14, 1947; slope near Kolomoki Mounds, *7971*, April 4, 1948. Our plants differ somewhat from the northern specimens and may constitute a southern sub-species.

*CAREX PHYSORHYNCHA Liebm. is infrequent in rich, dry woods. *Clay:* near Fort Gaines, *2488*, Mar. 29, 1947; *9313*, Mar. 27, 1949;

3 miles west of Coleman, *8203*, Aug. 19, 1948; *9327*, Mar. 28, 1949. *Decatur:* 1 mile north of Chattahoochee, Florida, *9087*, Mar. 22, 1949. *DeKalb-Fulton* county line: Lenox Park area, *W. H. Duncan 9118*, Apr. 4, 1949. *Early:* bluff along Chattahoochee River west of Hilton, *2893*, April 10, 1947; rocky woods west of Saffold, *9202*, Mar. 26, 1949; along Dry Creek, 4 miles east of Blakely, *9255*, Mar. 27, 1949. *Harris:* along Standing Boy Creek, *W. H. Duncan 9245*, with S. J. Smith, April 8, 1949. *Jasper:* ravine east of Ocmulgee River, *W. H. Duncan 9169*, April 6, 1949. *Rabun:* slopes at Glades Falls southwest of Glade Mt., *W. H. Duncan 9308*, with S. J. Smith, April 16, 1949.

*Carex straminea Willd. (*C. richii* (Fern.) Mack.), reported by Fernald (1950) only from Massachusetts and Michigan south to the District of Columbia and Indiana, was found in the shallow water of a roadside marsh near Leary, *Calhoun* County, by *S. J. Smith et al. 3700*, Mar. 31, 1948 (Weigand Herbarium). This species is very doubtfully distinct from *C. alata* Torr. from which it differs in only minor details.

Among the fifty additional species of *Carex* found by the writer in southwestern Georgia are many that are considered rare in Georgia.

*Eleocharis nodulosa (Roth) Schult., reported by Svenson (1937) only from Florida to Arizona in the United States, is infrequent in small ponds, borrow-pits, and ditches in southernmost Georgia. *Decatur:* 3 miles south of Bainbridge, *4623*, June 12, 1947; 12 miles southwest of West Bainbridge, *4731*, June 17, 1947; 1.5 miles south of Recovery, *8683*, Aug. 27, 1948; several miles northwest of West Bainbridge on the Mitchell County line near the Flint River. *Early:* woodland borrow-pits near Kirkland Creek southeast of Saffold, *6683*, Sept. 16, 1947.

*A Fimbristylis, number *6510*, collected in *Miller* County, Sept. 4, 1947, several miles east of Colquitt in wet sand along the margin of a small pond, appears to be an introduced species, like *F. miliacea* Vahl and *F. schoenoides* Vahl., both rare in southwestern Georgia. Although the plants have the general appearance of *F. annua* Vahl of the tropics, they are certainly distinct from that species. The achenes are more nearly orbicular and much more finely (15-19) ridged than the obovate, coarsely (7-9) ridged achenes of *F. annua*. As yet, no name has been found for these plants, which have also been picked up by Dr. Neil Hotchkiss of the United States Biological Survey.

*Rhynchospora decurrens Chapm. is infrequent in moist pinelands and shallow water of cypress ponds. *Calhoun:* 5 miles east of

Cordrays Mill, *4659*, June 14, 1947; 2 miles east of Cordrays Mill, *4708*, June 14, 1947. *Dougherty:* 2 miles west of Pretoria, *3970*, May 17, 1947; 1 mile west of Pretoria, *4547*, June 10, 1947. *Miller:* Babcock Pond, *6634a*, Sept. 12, 1947.

*RHYNCHOSPORA INTERMIXTA C. Wright, not reported from north of Florida by Small (1933), is infrequent in moist pinelands and open, grassy areas on the Dougherty Plain of southern Georgia. *Baker:* near Mimsville, *4853*, June 21, 1947; damp sand near Mossy Pond, *4877*, June 23, 1947. *Miller:* 7 miles east southeast of Colquitt, *5184*, July 8, 1947. *Worth:* 3.5 miles west of Sylvester, *6352b*, Aug. 25, 1947.

Among the more than thirty additional species of *Rhynchospora* collected in southwestern Georgia is one species that seems to be undescribed. Likewise among 11 species of *Scleria* collected in the same section of the state one species is considered new to science by Dr. Earl L. Core (personal communication). It is planned to treat these undescribed sedges in a later paper.

SCIRPUS HALLI A. Gray is considered such a rare plant that it seems best to put on record here the four collections of it made in southwestern Georgia. It is rare in shallow intermittent ponds and on sandy margins of permanent ponds on the Dougherty Plain. *Decatur:* Douglas Lake *6536*, Sept. 8, 1947; Open Pond, *6553*, Sept. 9, 1947. *Dougherty:* small pond 6 miles south of Albany, *1811*, Aug. 5, 1946; *2277*, Sept. 9, 1946.

LEMNACEAE

*WOLFFIA PAPULIFERA Thompson is not mapped at all by Muenscher (1944) from the southeast. This floating plant, however, is known now from Florida (Jacobs, 1949) and Virginia, and was collected at two stations in southwestern Georgia. *Decatur:* Douglas Lake, Mar. 23, 1949. *Early:* cypress swamp 3 miles east of Arlington, *4056*, May 20, 1947; *7346*, Oct. 22. 1947. It should be expected in other parts of the southern Coastal Plain.

XYRIDACEAE

*XYRIS FLABELLIFORMIS Chapm., perhaps not distinct from *X. brevifolia* Michx., is infrequent in moist pinelands and boggy areas in southern Georgia. *Calhoun:* 2 miles southeast of Cordrays Mill. *Decatur:* 1 miles north of Faceville; 1 mile east of Recovery. *Early:* 2 miles south of Hilton; Big Cypress area, *3307*, April 24, 1947. *Miller:* 1 mile west of Colquitt, *3160*, Apr. 21, 1947.

*XYRIS SEROTINA Chapm., the rarest of the 13 *Xyris* species collected in southwestern Georgia, like the preceding species has not

been reported from north of Florida. The writer found it in moist pineland 11 miles northwest of Colquitt, *Early* County, *6815a*, Sept. 25, 1947. This species, like *Xyris iridifolia* Chapm. has pulverulent seeds, a distinctive characteristic overlooked in most keys to the species of this genus.

COMMELINACEAE

*COMMELINA COMMUNIS L. has been collected at widely scattered Stations in Georgia. *Clarke:* Athens, *J. M. Reade*, Oct. 5, 1928. *Dougherty:* Albany, *4490*, June 6, 1947; near Dawson Road, about 5 miles from Albany, *P. R. Shelley 34*. *Fulton: Hattie Rainwater*, Sept. 19, 1929. *Muscogee:* Columbus, *M. L. Bryan*, Oct. 1, 1929. *Oconee:* bottomland, *J. M. Reade*, Oct. 20, 1928. *Rabun:* near Rabun Gap, *W. H. Duncan 1118*, Sept. 8, 1938.

LILIACEAE

*ALLIUM MICROSCORDION Small, known from western Florida to Texas and Nebraska, is infrequent in dry oak or pine woods and on sandy roadsides in southwestern Georgia. *Baker:* 1-2 miles northeast of Newton, *3404*, Apr. 28, 1947; *3512*, May 3, 1947. *Calhoun:* 6 miles east of Arlington, *3346*, Apr. 25, 1947. *Dougherty:* 1 mile west of Pretoria, *2738*, Apr. 4, 1947. *Early:* near Jakin, *3176*, Apr. 21, 1947; near Saffold, *2270*, Apr. 5, 1947.

*HEMEROCALLIS FULVA L., the introduced day-lily, is an escape on roadsides. *Cherokee:* 6 miles southwest of Canton, *W. H. Duncan 8368*, June 13, 1948. *Clay:* Fort Gaines. *Early:* 7 miles northwest of Blakely, *4171*, May 24, 1947. *Gwinnett:* 7 miles north of Lawrenceville, *W. H. Duncan 3599*, June 25, 1941.

*VERATRUM INTERMEDIUM Chapm. is a little-known species previously reported only from Middle Florida (between the Apalachicola and Suwanee rivers), and probably not collected there in recent years. It is infrequent on rich, loamy, wooded ravine slopes in the Red Hills of southwestern Georgia. *Clay:* ravines near Fort Gaines, *4925*, June 24, 1947; *5828*, Aug. 2, 1947; *6995*, Oct. 2, 1947. *Early:* along Grimsleys Mill Branch, *4336*, May 31, 1947; *8522*, Aug. 24, 1948; rich slope along south side of Colomokee Creek, 8 miles south of Fort Gaines, *6123*, Aug. 8, 1947.

AMARYLLIDACEAE

*ZEPHYRANTHES CANDIDA (Lindl.) Herb., reported only from Florida to Texas was found in a sandy field 4 miles south of Damascus, *Miller* County, *5442*, July 18. 1947.

CANNACEAE

*Canna indica L., also reported only from Florida to Texas, was found over-running a peanut hull dump at the edge of a swamp on the outskirts of Blakely, *Early* County, *4979*, June 26, 1947.

ORCHIDACEAE

*Eulophia ecristata (Fern.) Ames, (*Triorchos ecristatus* (Fernald) Small), a terrestrial orchid of tropical affinities, has been reported from Florida by Small (1933) and also from Louisiana and North Carolina by Correll (1940). The writer has collected it twice in rolling pinelands in southern Georgia. *Berrien:* near Enigma, *2270*, Sept. 7, 1946. *Worth:* near Dry Creek near the southeastern corner of Dougherty County, *6092*, Aug. 14, 1947.

SALICACEAE

*Salix rigida Muhl. (*S. cordata* Muhl.), a wide-ranging willow previously reported as far south as Alabama, is rare along stream margins in southwestern Georgia. *Clay:* along Colomokee Creek south of Fort Gaines, *3799*, May 9, 1947. *Quitman:* swamp 1 mile east of Georgetown, *3147*, Apr. 16, 1947.

CHENOPODIACEAE

*Chenopodium carinatum R. Br., a native of Australia and Tasmania, is not included in Small's *Manual*. Most of the reports of this species in the United States seem to be referable to a closely related species, *C. pumilio* R. Br. (Aellen and Just, 1943). Our material, however, has very definitely keeled perianth tips, and is presumably good *C. carinatum*. It is a rare weed of roadsides and waste places. *Baker:* under highway bridge over Ichawaynochaway Creek near the Field Station, *7515*, Nov. 5, 1947. *Decatur:* roadside in Faceville, *4758*, June 17, 1947; weed under highway bridge over Flint River at Bainbridge, *5172*, July 5, 1947.

AMARANTHACEAE

*Iresine rhizomatosa Standley is rare in wooded bottoms along the Chattahoochee River. *Early:* near mouth of Sowhatchee Creek, *7122*, Oct. 8, 1947; near mouth of Coheelee Creek west of Hilton, *7423*, Oct. 29, 1947.

CORRIGIOLACEAE

Siphonychia diffusa Chapm. is not reported from Georgia by Core (1939) although Small (1933) includes Georgia in the range

assigned to this species. The writer collected it only in dry, sandy oak-pine woods west of Mosquito Creek, 3 miles north of Chattahoochee, Florida, *Decatur* County, Georgia, *5917*, Aug. 8, 1947; *6160*, Aug. 20, 1947.

CARYOPHYLLACEAE

*ARENARIA PATULA Michx. (*Sabulina patula* (Michx.) Small) though not reported from east of Alabama by Steyermark (1941), was found on limestone outcrops near Greers Cave and the adjacent limestone quarry, *Randolph* County, *7676*, Mar. 28, 1948; *7924*, Apr. 3, 1948. *Walker:* 2.5 miles south of Chickamauga, *Pyron and McVaugh 2723*, Apr. 23, 1938.

RANUNCULACEAE

*DELPHINIUM AJACIS L. is an infrequent escape in waste places and on roadsides. *Clarke:* Athens, *Mrs. K. M. Drury*, May 13, 1929. *Clay:* Fort Gaines. *Decatur:* Bainbridge. *Dougherty:* Albany; roadside 3 miles east of Pretoria, *3844*, May 14, 1947. *Miller:* Colquitt, *4399*, June 3, 1947. *Mitchell:* Baconton. *Seminole:* Donalsonville, *4253*, May 27, 1947. *Sumter:* Plains.

LAURACEAE

*CINNAMOMUM CAMPHORA (L.) Nees and Everm. (*Camphora camphora* (L.) Karst) is a rare escape from cultivation on roadsides and in a ravine 1 mile north of Chattahoochee, Florida, *Decatur* County, Georgia, *2654*, Apr. 2, 1947; *5284*, July 10, 1947.

FUMARIACEAE

*CORYDALIS FLAVULA (Raf.) DC. (*Capnoides flavulum* (Raf.) Kuntze) was collected once in moist, wooded bottoms along the Chattahoochee River near Neal's Landing bridge, *Seminole* County, *2661*, Apr. 2, 1947.

CRUCIFERAE

*RAPHANUS RAPHANISTRUM L., not included in Small's *Manual*, is a frequent weed of grain fields and roadsides in southern Georgia. *Dougherty:* oat field south of Radium Springs, *2432*, Mar. 27, 1947; roadside 6 miles south of Albany, *3534*, May 5, 1947.

LEGUMINOSAE

*GALACTIA FLORIDANA Torr. and Gray, reported only from the Coastal Plain of Florida and Alabama by Small (1933), was collected in dry, sandy oak barrens between Open and Cane Water ponds, *Decatur* County, *5528*, July 21, 1947.

*SESBANIA EXALTATA (Raf.) Cory (*Sesban exaltata* (Raf.) Rydb.) is infrequent in moist places. *Decatur:* 3 miles northeast of Faceville. *Dougherty:* 6 miles south of Albany, *1810*, Aug. 5, 1946; *7016*, Aug. 4, 1947. *Miller*: along Spring Creek just west of Colquitt. *Seminole:* near Neal's Landing bridge. *Wayne:* 1 mile south of Jesup, *W. H. Duncan 7860*, Sept. 13, 1947.

*VICIA MICRANTHA Nutt. is rare on bluffs, in ravines, and in waste places. *Clay:* bluff along Chattahoochee River at Fort Gaines, *2491*, Mar. 29, 1947; near the railroad terminal at Fort Gaines, *9296*, Mar. 27, 1949. *Decatur:* rich woods of ravines 1 mile north of Chattahoochee, Florida, *2577*, Mar. 31, 1947; *3090*, Apr. 14, 1947. This species also occurs in western Florida although reported from neither Florida nor Georgia by Small (1933).

Several cultivated legumes have become naturalized or are spontaneous in Georgia, although not indicated from the state by Small (1933). Among these are ARACHIS HYPOGAEA L. (so important in the economy of southwestern Georgia), *CROTALARIA MUCRONATA Desv., (*C. striata* DC.) C. RETUS, L., C. SPECTABILIS Roth (the most extensively planted of the Crotalarias), *LESPEDEZA CUNEATA (Dumont) G. Don, *LUPINUS ANGUSTIFOLIUS L. (the widely planted blue lupine), *VICIA CRACCA L., and *V. TETRASPERMA (L.) Moench. Two ornamentals which are also occasionally spontaneous are *PARKINSONIA ACULEATA L. and *SESBANIA PUNICEA (Cav.) Benth.

POLYGALACEAE

*POLYGALA LEPTOSTACHYS Shuttlw., not previously reported north of Florida, was collected in a dry, sandy, open area 11 miles northeast of Newton, *Baker* County, *5398*, July 16, 1947.

*POLYGALA NUTTALLII T. and G. was also collected in the same open, grassy area 11 miles northeast of Newton, *Baker* County, *6196*, Aug. 21, 1947.

EUPHORBIACEAE

*ACALYPHA SETOSA A. Rich., reported by Small (1933) to be naturalized only in Florida, is a rare weed of waste places and stream banks in southwestern Georgia. *Dougherty:* Albany, *5397*, July 15, 1947. *Early:* bank of Chattahoochee River near Hilton, *5389*, July 15, 1947. *Mitchell:* along Flint River near Baconton. This species is superficially very similar to *A. ostryaefolia* Ridd., which occurs in similar habitats as a rare weed; hence, it may previously have been confused in Georgia with that species.

Several weedy species of *Euphorbia*, not reported from Georgia by Wheeler (1941), were found in southern Georgia. *E. HYSSOPIFOLIA L. (*Chamaesyce hyssopifolia* of Small's *Manual* in part) was collected once near the railroad yard in Albany, *Dougherty* County, *3810*, May 10, 1947. *E. PROSTRATA Ait. (*E. chamaesyce* sensu Wheeler, not L.) was also collected in Albany, *3809*, May 10, 1947, and observed in Leary, Calhoun County. *E. HIRTA L. (*Chamaesyce hirta* (L.) Millsp.) was observed by the writer in a lawn on Jekyll Island, Glynn County in southeastern Georgia, Sept. 3, 1948.

*MANIHOT ESCULENTA Crantz (*Jatropha manihot* L.), growing luxuriantly as large shrubs, was found overrunning a dump along Spring Creek near Colquitt, *Miller* County, *5866*, Aug. 6, 1947. Since August 1947, dumping operations have covered or otherwise destroyed most of the shrubs, and in March, 1949, only a few shrubs remained. Another plant of great economic importance, especially in Georgia, *ALEURITES FORDII Hemsley, was found to be occasionally spontaneous along streams and near tung orchards, *2731*, Apr. 4, 1947; *7586*, Nov. 12, 1947.

*TRAGIA BETONICAEFOLIA Nutt. is infrequent in sandy pinelands in southern Georgia. *Baker:* near Mossy Pond, *4843*, June 21, 1947; Rattlesnake Bottoms. *Decatur:* 8 miles southwest of West Bainbridge. *Early:* Big Cypress area, *5178*, July 7, 1947; 2 miles south of Hilton; near Porter's Pond. *Miller:* 2 miles north of Donalsonville, *3433*, Apr. 28, 1947; *4216*, May 27, 1947. *Seminole:* along railroad in Donalsonville, *4236*, May 27, 1947.

TRAGIA LINEARIFOLIA Ell., reported only from Florida to Alabama by Small (1933), was earlier reported (1906) from southwestern Georgia by Harper. It is rare in dry, sandy oak barrens and open oak-pine woods. *Decatur:* sandy barrens two miles east of Recovery, *4753*, June 17, 1947. *Randolph:* 1 mile west of Coleman, *8155*, Aug. 19, 1948. This species is none too distinct from *T. urens* L., and may be only an extreme linear-leaved variety of it.

CALLITRICHACEAE

*CALLITRICHE PEPLOIDES Nutt. is rare in wet sand. *Decatur:* 3 miles northeast of Faceville, *2539*, Mar. 31, 1947; along Four-mile Creek 3½ miles south of Bainbridge, *4636*, June 12, 1947.

MALVACEAE

*MALVAVISCUS DRUMMONDII T. and G. is a rare escape in waste places and on roadsides. *Dougherty:* vacant lot near the Albany

railroad station, *5853*, Aug. 5, 1947. *Lee:* roadside 5 miles northeast of Albany.

CACTACEAE

*Opuntia ficus-indica (L.) Mill. is infrequent along roadsides where it is apparently an escape from cultivation although it is found in places remote from present human habitation.

LYTHRACEAE

*Cuphea carthagenensis (Jacq.) Macbr., was collected in flatwoods along a highway 1 mile east of Willacoochee, Atkinson County, *2244*, Sept. 7, 1946.

ONAGRACEAE

*Gaura parviflora Dougl. ex Hook.[1] was collected in waste ground in Albany, *Dougherty* County, *5112*, July 4, 1947.

*Ludwigia spathulata T. and G., reported by Munz (1944) only from northern Florida, was found on the wet margin of Douglas Lake, *Decatur* County, *6155*, Aug. 20, 1947.

HALORAGACEAE

*Myriophyllum pinnatum (Walt.) B.S.P., not indicated from Georgia by Muenscher (1944), is rare on muddy margins and in shallow water of ponds. *Effingham:* Wilson's Mill Pond, near Springfield, *Don Eyles 6139*, June 27, 1939. *Floyd:* Lav. Mt. pond, Mt. Berry, *H. C. Jones*, Apr. 5, 1939. *Miller:* Babcock Lake, *7331b*, Oct. 24, 1947. *Seminole:* Ray's Lane, *9119*, Mar. 23, 1949.

UMBELLIFERAE

*Ammi majus L., a sporadic escape in the western hemisphere, was collected from a roadside ditch on the outskirts of Morgan, *Calhoun* County, *3723*, May 6, 1947.

*Apium leptophyllum (Pers.) F. Muell. is a frequent weed along roadsides and in waste places in southern Georgia, *2939*, *3260*, *7823*, *9073*, *9132*, *9135*, *9126*, *9158*, *9306a*.

ERICACEAE

*Gaylussacia mosieri Small, known previously only from Florida to Louisiana, occurs also in southern Georgia. *Decatur:* 3 miles northeast of Faceville, *1723*, July 27, 1946. *Early:* bog 2 miles south of Hilton, *3601*, May 2, 1947.

SAPOTACEAE

*Bumelia thornei Cronquist, known only from southwestern Georgia, has recently been described in *Castanea* (1949) and its known stations listed therein.

OLEACEAE

*Forestiera porulosa (Michx.) Poir. was reported by Small (1933) only from southern Florida. The writer, however, found it to be a common shrub in a small hammock in salt marshes west of Brunswick, *Glynn* County, *6265*, Aug. 23, 1947; *8833*, Sept. 2, 1948.

Several cultivated members of the Oleaceae are rare or infrequent escapes from cultivation in southwestern Georgia. *Jasminum mesnyi Hance, (*J. primulinum* Hemsl.) was collected from a thicket at the edge of a limesink along a roadside near Chehaw State Park, *Lee* County, *8274*, Aug. 21, 1948. *Ligustrum lucidum Ait. is rarely spontaneous in vacant lots and on roadsides, *4379*, June 2, 1947; *8792*, Aug. 30, 1948. *L. sinense Lour. is infrequent in vacant lots, waste places, on roadsides, and along streams, *4382*, June 2, 1947; *7585*, Nov. 13, 1947.

GENTIANACEAE

Sabatia foliosa Fernald, though reported by Small (1933) only from Florida and Alabama, is infrequent in shallow cypress ponds and on wet, sandy margins of streams in southwestern Georgia. *Baker:* Mossy Pond, *1478*, July 12, 1946. *Decatur:* along Spring Creek 8 miles above power dam, *5226*, July 9, 1947; shore of small pond, *Harper* (1903). *Early:* cypress ponds in Big Cypress area, *1449*, July 10, 1946; *1457*, July 11, 1946; *6521*, Sept. 5, 1947; *Duncan 4040*. *Mitchell:* along Raccoon Creek 12 miles northeast of Camilla, *5784*, July 31, 1947.

ASCLEPIADACEAE

*Matelea alabamensis (Vail) Woodson (*Cyclodon alabamense* (Vail) Small) has previously been considered endemic in Alabama. It is rare in dry, rich woods of ravine slopes in southwestern Georgia, and is to be expected in western Florida. *Clay:* ravines near Fort Gaines, *3784*, May 9, 1947; *4157*, May 24, 1947. *Decatur:* slopes 1 mile north of Chattahoochee, Florida, *9089*, Mar. 22, 1949. *Early:* dry woods along left bank of Colomokee Creek south of Fort Gaines, *6122*, Aug. 18, 1947.

CONVOLVULACEAE

*Ipomoea lacunosa L. is rare along streams. *Early:* sandbar along Sowhatchee Creek near junction with Chattahoochee River,

7104, Oct. 8, 1947. *Mitchell:* along Flint River at mouth of Racoon Creek.

VERBENACEAE

*LIPPIA LANCEOLATA Michx. is infrequent on banks of the Chattahoochee River. *Early:* west of Hilton, *5340*, July 16, 1947; Gilbert's Landing. *Seminole:* near Neal's Landing bridge, *5634*, July 25, 1947; Butlers' Landing.

*VERBENA SCABRA Vahl. is rare in moist woods and swampy places. *Dougherty:* cut-over area between hammock and roadbank near Cooleewahee Creek east of Pretoria, *7247*, Oct. 15, 1947. *Lee:* moist woods near Indian Den along Fowltown Creek near Armena, *8412*, Aug. 22, 1948.

The Verbenaceae are well represented in Georgia by introduced plants, both weeds and escapes from cultivation. *CLERODENDRON BUNGEI Steud. was found overrunning Fort Frederica National Monument on St. Simon's Island, *Glynn* County, *2229*, Sept. 6, 1946. *VERBENA LITERALIS H. B. K. was also found near Brunswick, *Glynn* County, *6253*, Aug. 22, 1947, and along a roadside in West Bainbridge, *Decatur* County, *5150*, July 5, 1947. This weed has not previously been reported east of Louisiana. Several other introduced Verbenaceae collected during the survey were not reported from Georgia by Small (1933) but have since been reported by other workers. They are VERBENA BONARIENSIS L., V. BRASILIENSIS Vell., and LANTANA MONTEVIDENSIS (Spreng.) Briq.

LABIATAE

*HYPTIS MUTABILIS (A. Rich.) Briq., reported by Small (1933) only from Florida, is an infrequent weed of river banks and waste places. *Clay:* near Fort Gaines. *Decatur:* 1 mile north of Chattahoochee, Florida; along Flint River at West Bainbridge, *5151*, July 5, 1947. *Early*: west of Hilton, *5382*, July 15, 1947; near Gilbert's Landing, *7287*, Oct. 17, 1947; near junction of Sowhatchee Creek and Chattahoochee River, *7099*, Oct. 8, 1947. *Seminole:* near Neal's Landing bridge, *5622*, July 25, 1947. *Ware:* Waycross, *W. H. Duncan 11788*, Aug. 19, 1950.

*MICROMERIA PILOSIUSCULA (A. Gray) Small, reported from Florida to Texas, was collected also in southern Georgia on the wet margin of Spring Creek, 5 miles above the power dam, *Decatur* County, *5235*, July 9, 1947.

SOLANACEAE

*NIEREMBERGIA FRUTESCENS Dur. is a rare escape collected once from a roadside 5 miles northwest of Blakely, *Early* County, *4170*, May 24, 1947.

*SOLANUM PSEUDO-CAPSICUM L., the Jerusalem-cherry, reported from Florida to Texas, was found well-established on the Simmons Farm, 6 miles northwest of Blakely, *Early* County, *6841*, Sept. 25, 1947, having been there as long as Mr. Simmons could remember.

*SOLANUM SISYMBRIFOLIUM Lam. likewise was not reported from north of Florida. It is, however, a frequent weed in Brunswick, *Glynn* County, *6251*, Aug. 22, 1947; *8840*, Sept. 3, 1948; *Pyron and McVaugh 1425*, Mar. 22, 1937.

*SOLANUM TORREYI A. Gray is the western species that Small (1933) apparently reported from northern Florida and southern Georgia as *S. perplexus* Small. In southwestern Georgia it is an infrequent weed of roadsides and sandy fields. *Clay:* 8 miles south of Fort Gaines, *4163*, May 24, 1947. *Dougherty:* 1 mile north of Pretoria, *4010*, May 17, 1947. *Early:* field near Kolomoki Mound north of Blakely; field near Nantz Spring 1 mile east of Arlington, *4061*, May 20, 1947.

LENTIBULARIACEAE

*UTRICULARIA FOLIOSA L., not previously reported north of Florida, is infrequent in the shallow water of ponds in southwestern Georgia. *Decatur:* Cane Water Pond, *3944*, May 15, 1947; Open Pond, *6555*, Sept. 9, 1947; *8637*, Aug. 27, 1948. *Early:* Porter Pond, *9237*, Mar. 26, 1949; mill pond several miles north of Cedar Springs. *Lee:* Silver Lake, *8285*, Aug. 21, 1948. *Seminole:* Lewis Pond:

*UTRICULARIA GIBBA L., not mapped from Georgia by Muenscher (1944), was found in shallow water of a small pond in pinelands one-half mile west of Pretoria, *Dougherty* County, *4004*, May 17, 1947, and in a pond on St. Simon's Island, *Glynn* County, *2197*, Sept. 5, 1946.

*UTRICULARIA OLIVACEA Wright (*Biovularia olivacea* (Wright) Kam.) was reported by Small (1933) only from the vicinity of Sanford, Seminole County, Florida. This tiny floating plant, however, was found in great abundance in the shallow water of Chesser Prairie, Okefenokee Swamp, *Ware* County, Georgia, *2092*, Sept. 3, 1946; *8812*, Sept. 1, 1948

UTRICULARIA VULGARIS L. (including *U. floridana* Nash), though reported from Georgia (as *U. floridana*), is rare in the state. The writer found it associated with *U. gibba* in a small pond on St. Simon's Island, *Glynn* County, *2197*, Sept. 5, 1946.

ACANTHACEAE

*Hygrophila lacustris (Schlecht.) Nees, chiefly a plant of the Mississippi Delta but reported from as far east as western Florida, was found in shallow water of Fourmile Creek south of Bainbridge, *Decatur* County, *4630*, June 12, 1947.

RUBIACEAE

*Borreria leavis (Lam.) Griseb. is rare in alluvial bottoms along the Flint River and on woody ravine slopes. *Baker:* along Flint River near junction with Ichawaynochaway Creek, *5808a*, July 30, 1947; Rattlesnake Bottoms, *7139*, Oct. 9, 1947. *Decatur:* West Bainbridge, *5165*, July 5, 1947; 1 mile north of Chattahoochee, Florida, *5919*, Aug. 8, 1947.

CUCURBITACEAE

*Lagenaria siceraria (Molina) Standl. (*Cucurbita lagenaria* L.), the common gourd, is occasionally spontaneous on roadsides and in waste places in southwestern Georgia. *Miller:* 11 miles east of Colquitt, *4981*, June 26, 1947; Colquitt; near Babcock Pond. *Early:* near Blakely.

CAMPANULACEAE

Wahlenbergia marginata (Thunb.) A. DC seems to be a recent introduction in southwestern Georgia and southeastern Alabama. The writer found it to be an infrequent weed of roadsides and old fields. *Clay:* near Fort Gaines, *3661*, May 6, 1947; *3678*, May 6, 1947; *4333*, May 31, 1947. *Dougherty:* Radium Springs, *3390*, Apr. 26, 1947; 3-4 miles south of Albany, *3522*, May 3, 1947; *4460*, June 5, 1947. *Effingham:* 19 miles west of Savannah, *Arthur Cronquist 4287*, Apr. 12, 1947.

COMPOSITAE

*Bidens discoidea (T. and G.) Britt. is infrequent on floating logs and old stumps in cypress ponds. *Baker:* Mossy Pond, *1510*, July 15, 1946. *Early:* cypress swamp 1 mile east of Nantz Spring, *7344*, Oct. 22, 1947. *Miller:* 7 miles east of Colquitt. *Screven:* border of limesink near Blue Springs, *Don Eyles 7311*, Sept. 25, 1940. *Seminole:* near Big Pond on Trawick Place 7 miles south of Iron City.

*Chrysopsis oligantha Chapm. (*Pityopsis oligantha* (Chapm.) Small), reported previously only from northern Florida and southeastern Alabama, is rare in sandy pinelands on the Dougherty Plain of southwestern Georgia. *Early:* Big Cypress area, *4063*, May 22, 1947. *Miller:* 1 mile west of Colquitt, *4213*, May 27, 1947; 2 miles north of Donalsonville, *3429*, Apr. 28, 1947; *4422*, June 3, 1947. In

its extreme form this entity appears to be amply distinct, but some specimens (*1971*, June 26, 1947, from *Early* County and *5880*, Aug. 6, 1947, from *Miller* County) seem to be intermediate between *C. oligantha* and *C. graminifolia* (Michx.) Ell.

*COSMOS BIPINNATUS Cav. and **C. sulphureus* Cav. have spread from cultivation on roadsides and in waste places in southwestern Georgia. Several other ornamental composites, not indicated from Georgia by Small (1933), were found as infrequent escapes on the southern part of the state by the writer. Among these can be listed COREOPSIS BASALIS (Dietr.) Blake (*C. drummondii* (D. Don) T. and G.), C. TINCTORIA L., *GAILLARDIA PULCHELLA Foug., *CENTAUREA CYANUS L., and ZINNIA ELEGANS Jacq., the last species probably not persisting.

*HELIANTHUS CUCUMERIFOLIUS T. and G., apparently native on the coast of Louisiana and Texas, is a frequent weed of waste places and roadsides in southern Georgia and Florida. *Clay:* roadside 5 miles south of Fort Gaines, *4159*, May 24, 1947. *Seminole:* Donalsonville, *3912*, May 14, 1947; *4252*, May 27, 1947. *Taylor:* Mizelle, *Arthur Cronquist 5270*, May 23, 1948.

*HYPOCHAERIS BRASILIENSIS (Less.) Griseb., identified by Dr. S. F. Blake, seems to be a new introduction to this country. It is an infrequent weed of waste places and roadsides in southern Georgia. *Calhoun:* roadside near Cordrays Mill, *4150*, May 21, 1947; Morgan; Leary. *Decatur:* Bainbridge. *Dougherty:* vacant lot in Albany, *3728*, May 7, 1947. *Seminole:* along railroad 2 miles southeast of Donalsonville.

*SOLVIA SESSILIS R. and P., reported from northern Florida to Louisiana, is an infrequent weed of roadsides and lawns in southwestern Georgia. *Decatur:* West Bainbridge, *7878*, Mar. 31, 1948; Bainbridge. *Early:* Blakely. *Miller:* roadbank near Spring Creek just west of Colquitt, *3158*, Apr. 21, 1947; *4191*, May 27, 1947.

*TAGETES MINUTA L. has been reported from southeastern Virginia to South Carolina (Fernald, 1950). This native of Chile is apparently grown as an aromatic herb by some of the rural population, and has spread in great abundance in yards and for some distance down adjacent roadsides in the few places where noticed by the writer. *Clarke:* Athens, *W. H. Duncan 12051*, Oct. 24, 1950. *Clay:* 11 miles east of Fort Gaines, *7000*, Oct. 2, 1947. *Decatur:* near Recovery. *Fulton:* streambank, *Hattie Rainwater*, Oct. 12, 1929. *Mitchell:* few miles east of Baconton, *7577*, Nov. 12, 1947.

*TARAXACUM ERYTHROSPERMUM Andrz. is even more rare in southwestern Georgia than *T. officinale* Weber. It was collected only from a lawn in Albany, *Dougherty* County, *3727*, May 7, 1947; *7196a*, Oct. 11, 1947; *7318*, Oct. 21, 1947.

*VERNONIA MISSURICA Raf., identified by Dr. H. A. Gleason, was collected in a wet, sandy swamp 2 miles south of Hilton, *Early* County, *6045*, Aug. 12, 1947.

Summary

In a recent survey of the vascular plants of southwestern Georgia, over one hundred species were collected which apparently had never been reported from Georgia. Fixty-six of these species seem to be native to the state and therefore hitherto overlooked. Fifty-one are introduced species, some probably brought in very recently. Of these latter, twenty are merely weeds and twenty-one ornamentals or economic plants that have escaped from cultivation and become naturalized. Ten other species are sporadic escapes from cultivation, and presumably are not naturalized, such as the blue lupine, peanut, tung tree, and several ornamentals.

Of the native plants, twenty-three were known formerly from Florida and farther south or west, five from Alabama and west or north, and five from north of Georgia. The remainder were reported from adjacent states on at least two sides and therefore were to be expected from Georgia also. Three species were formerly considered as endemic to Florida or Alabama. At least four undescribed species were collected in southwestern Georgia, but only one has as yet been published.

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The Woody Plants of Coopers Rock State Forest*[1]

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Coopers Rock State Forest is located in northern West Virginia in both Monongalia and Preston Counties with approximately the same area in both counties. Morgantown, the site of West Virginia University, lies sixteen miles west of the forest. The forest contains over 13,000 acres with 450 acres of land lying outside the main body of the forest.

The history of what is now Coopers Rock State Forest dates back to the time of the iron industry of the 18th century. With the pioneers pushing westward into the Allegheny Plateau region, farming implements and other products of iron were needed. Since no roads connected this area with the markets in the east, the iron industry was born to meet this necessity. In 1789 the Davis Furnace was built on Quarry Run near where Route 73 now crosses. Later the Henry Clay and Woodgrove Furnaces were erected to help supply the growing industry. These furnaces produced only pig iron which was transported to a central point, the Anna Furnace, located below the present site of the Cheat Lake bridge where it was made into finished products. Charcoal was used as fuel for the furnaces and the luxuriant forest that covered the Chestnut Ridge area served as a source of raw material. Discovery of a much better grade of ore in the Lake States resulted in the decline and eventual abandonment of the local field but evidence of the old iron industry can still be located in Coopers Rock State Forest. The old roads, tramways, ore pits, furnaces and charcoal hearths can still be found by the keen observer.

During the present century, from 1916 to 1936, lumbering operations had its effect upon the conditions of the present forest. Buildings, saw dust piles, old logging roads and log skidways are evidence that the timber industry once benefitted from the forest.

The name, Coopers Rock, originated during the early history of the forest. A fugitive of the law escaped prison and lived under this rock from one to two years. Being a cooper by trade he made tubs and barrels to be sold to the surrounding neighbors. The rock itself presents a very beautiful scenic overlook of the Cheat River gorge and surrounding area.

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*This paper is an abridgment of a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science, in the Faculty of the Graduate School of West Virginia University.

[1]Contribution No. 59 from the Herbarium of West Virginia University.

Fig. 1. Looking into Cheat Canyon from Ccopers Rock. The canyon is over 1000 ft. deep at this point.

The highest point in the Forest, at the site of the Chestnut Ridge fire tower is 2600 feet above sea level and Cheat Lake, the lowest point, is 950 feet above sea level. Accurate climatic data have not been recorded in the Forest but statistics recorded for Morgantown can serve as an estimate. They are as follows: average annual rainfall, 40.61 inches; average January temperature, 32.3°F; average July temperature, 73.5°F; maximum temperature recorded, 105°F; minimum temperature recorded, −25°F; average length of growing season, 165 days.

Original Forests. The axe of the early settlers took a heavy toll of the virgin stands of timber that covered the Chestnut Ridge area. The original forests were essentially all of the hardwood type and, with the coming of the iron industry, were soon utilized. Some eight to ten thousand acres were removed for making charcoal. In 1910 there still remained about 5,000 acres of virgin timber along the waters of Cheat River but today what could be called virgin timber is either inaccessible or preserved for its aesthetic value.

Ecology. The most difficult task confronting this investigation was that of classifying the vegetative types known to be present in the forest. With the aid of Dr. E. H. Tryon and Mr. Clifford A. Myers, members of the staff, Division of Forestry, the writer lists the following forest cover types thought to exist within the forest:

COVE HARDWOOD—This type is common on the northern slopes and in moist coves. The dominant trees are, yellow poplar, basswood, red oak, black birch, black cherry and white ash. Type basis is twenty percent of the dominants being yellow poplar and black cherry.

MIXED OAKS—This type occurs on southern exposures and flat hilltops with the soil being dry and the humus layer thin. Sixty percent of the stand, for type basis, includes red oak, black oak, white oak and scarlet oak in the dominant class.

CHESTNUT OAK-SCARLET OAK—At the top of precipitous slopes and on the ridgetops this type predominates. The soil is usually thin and sterile. Ten percent of the dominant class is composed of scarlet oak and chestnut oak for type basis.

HEMLOCK—In the cool moist coves and along some of the streams the hemlock type persists as the dominant species. Hemlock forms at least ten percent of the stand for type basis. Along Little Laurel Run, near the eastern boundary and Route 73, there is still present a virgin stand of hemlock. This is one of the few remaining stands of virgin timber still in existence in the state.

MIXED HARDWOOD—Along the steep slopes below Coopers Rock there occurs a type that can not, in the writer's opinion, be described under any classification recognized by the Forest Service. Many different species are found here with no one species or group of species being dominant. Some of the more important trees are white ash, basswood, shagbark hickory, bitternut hickory, red oak, chinquapin oak, sugar maple, and slippery elm.

Other types of communities of minor importance do occur in the forest but for the purpose of this report are not included. Today, with the forest for the most part in a reproductive stage, many changes are taking place in the vegetation but the types listed should remain the climax associations.

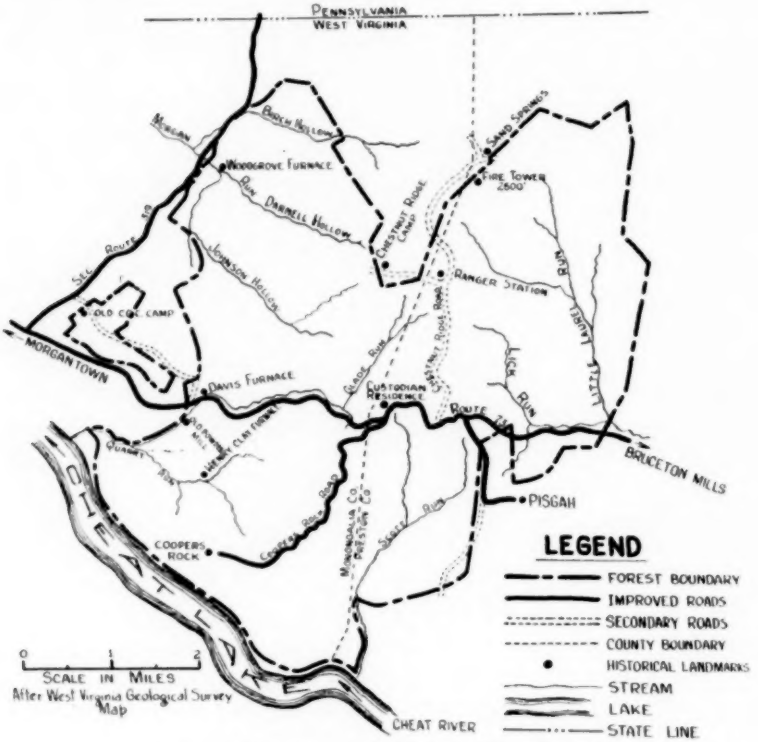

Fig. 2. Map of Coopers Rock State Forest

THE CATALOGUE

The following catalogue of woody plants has been compiled from every available source of information. All of the plants listed below have been collected within the boundaries of the Coopers Rock State Forest and deposited in the herbarium of West Virginia University with the exception of those collected by O. E. Jennings. His collections are on file at the Carnegie Museum. This list is not intended to be complete as future study will uncover new species not reported by this investigation.

PINACEAE

PINUS STROBUS L. White Pine. Found only on the east banks of Cheat Lake below Coopers Rock.

PINUS RESINOSA Ait. Red Pine. Not native to the forest. Found only in plantations along the Coopers Rock and Chestnut Ridge roads.

PINUS RIGIDA Mill. Pitch Pine. Restricted to the drier sites. Found along Route 73 at Quarry Run and one specimen was collected at the old lumber camp on Scott Run.

PICEA RUBENS Sarg. (*P. rubra* Dietr.). Red Spruce. Not native. Known only from planted stock at the archery course and near Coopers Rock.

TSUGA CANADENSIS (L.) Carr. Eastern Hemlock. In moist sites and along streams. A virgin stand still remains along Little Laurel Run near the eastern boundary of the forest.

CUPRESSACEAE

JUNIPERUS VIRGINIANA L. Eastern Red Cedar. Found only on the limestone outcrop along the trail leading from Coopers Rock to Cheat Lake.

LILIACEAE

SMILAX GLAUCA Walt. Glaucous Greenbrier. Common throughout the forest on dry sites.

SMILAX ROTUNDIFOLIA L. Greenbrier. Common throughout the forest.

SMILAX HISPIDA Muhl. Hispid Greenbrier. Found only on the east side of Cheat Lake below Coopers Rock.

SALICACEAE

SALIX HUMILIS Marsh. Upland Willow. Rare. Found along Route 73 east of Chestnut Ridge road.

SALIX HUMILIS var. RIGIDIUSCULA (And.) R. & F. Prairie Willow. Collected only from the filtration ditch at the old CCC camp site.

SALIX NIGRA Marsh. Black Willow. Restricted to damp sites and along streams in open areas.

SALIX SERICEA Marsh. Silky Willow. Common in damp sites and along streams.

SALIX RIGIDA Muhl. (*S. cordata* Muhl) Heartleaf Willow. Found only on Quarry Run at its junction with Route 73.

SALIX FRAGILIS L. Crack Willow. Collected along Route 73 east of Chestnut Ridge road. Rare. Found only at this site.

SALIX CINEREA L. Pussy Willow. This specimen was found on the old Ryan farm near the ranger station. A cultivated plant not native to the forest.

SALIX TRISTIS Ait. Dwarf Gray Willow. Collected one mile east of the Oak Grove school near the forest boundary line.

SALIX CAROLINIANA Michx. (*S. Wardi* Bebb.). Ward's Willow. Collected by Jennings two miles south of Mont Chateau on a sandy island before the area was flooded.

POPULUS GRANDIDENTATA Michx. Big-tooth Aspen. Found throughout the forest on the richer soils.

JUGLANDACEAE

JUGLANS CINEREA L. Butternut. White Walnut. Common throughout the forest in moist sites.

JUGLANS NIGRA L. Black Walnut. Not as common as the preceding species but found throughout the forest.

CARYA OVATA (Mill.) K. Koch. Shagbark Hickory. Found throughout the forest but more common along Cheat Lake.

CARYA TOMENTOSA Nutt. (*C. alba* (L.) K. Koch.). Mockernut Hickory. Not common. Found throughout the forest.

CARYA GLABRA (Mill.) Sweet. Pignut Hickory. The most common of the hickories in the forest.

CARYA OVALIS (Wang.) Sarg. Oval Pignut Hickory. Specimens were found in most parts of the forest but not common.

CARYA CORDIFORMIS (Wang.) K. Koch. Bitternut Hickory. Common on the rich soils throughout the forest.

CORYLACEAE

CORYLUS AMERICANA Walt. Hazelnut. Limited but common in Darnell Hollow.

OSTRYA VIRGINIANA (Mill.) K. Koch. Ironwood. Hophornbeam. Found only in Johnson Hollow and along the trail below Coopers Rock.

CARPINUS CAROLINIANA Walt. Blue Beech. American Hornbeam. Restricted to the banks of the lake below Coopers Rock.

BETULA LENTA L. Black Birch. One of the more common plants in the forest.

BETULA LUTEA Michx. f. Yellow Birch. Frequent in moist coves and along streams.

ALNUS SERRULATA (Ait.) Willd. (*A. rugosa* (Ait.) Willd.) Brookside Alder. Common in wet places and along streams.

FAGACEAE

FAGUS GRANDIFOLIA Ehrh. Beech. Limited to the moist sites. Most common along Cheat Lake below Coopers Rock.

CASTANEA DENTATA (Marsh.) Borkh. Chestnut. Common throughout the forest where it has arisen from stump sprouts. Blight has eliminated all plants of tree size.

QUERCUS ALBA L. White Oak. Common throughout the forest.

QUERCUS MUEHLENBERGII Engelm. Yellow Oak. Chinquapin Oak. Found only below Coopers Rock along the trail to Cheat Lake.

QUERCUS MONTANA Willd. (*Q. Prinus* L.) Chestnut Oak. Rock Oak. One of the more common trees on hilltops and ridges.

QUERCUS BOREALIS Michx. f. (*Q. rubra* L.) Red Oak. Common in all parts of the forest and is one of the better timber trees.

QUERCUS VELUTINA Lam. Black Oak. Common throughout the forest.

QUERCUS COCCINEA Muenchh. Scarlet Oak. Found on the drier soils. common on hilltops and ridges along with chestnut oak.

ULMACEAE

ULMUS RUBRA Muhl. (*U. fulva* Michx.) Slippery Elm. Frequent in moist rich soils. Common along Cheat Lake.

CELTIS OCCIDENTALIS L. Hackberry. Found along the trail from Coopers Rock to Cheat Lake and on the outside tract near the old CCC camp.

MORACEAE

MORUS RUBRA L. Red Mulberry. Found in Johnson Hollow and near the old CCC camp along the secondary road between Route 319 and Rt. 73.

SANTALACEAE

PYRULARIA PUBERA Michx. Buffalonut. Found only along the banks of Cheat Lake.

ARISTOLOCHIACEAE

ARISTOLOCHIA DURIOR Hill. (*A. macrophylla* Lam.) Dutchman's Pipe. Found only along the slope below Coopers Rock.

RANUNCULACEAE

CLEMATIS VIRGINIANA L. Common Virgin's Bower. Common along roads and thickets where its vines form a closed canopy.

MAGNOLIACEAE

MAGNOLIA ACUMINATA L. Cucumber-Tree. Common in all parts of the forest but at no place abundant.

LIRIODENDRON TULIPIFERA L. Tuliptree. Abundant in coves and throughout the forest.

CALYCANTHACEAE

CALYCANTHUS FLORIDUS L. Sweet Shrub. Found on an abandoned farm one mile east of the Oak Grove school near forest boundary. This plant was left from past cultivation and is not native to the forest.

ANNONACEAE

ASIMINA TRILOBA (L.) Dunal. Papaw. Found only below Coopers Rock along the trail to Cheat Lake.

MENISPERMACEAE

MENISPERMUM CANADENSE L. Moonseed. Found only along the Darnell Hollow road near the old Darnell farmhouse.

BERBERIDACEAE

BERBERIS THUNBERGII DC. Japanese Barberry. Found only under wooded cover along the Chestnut Ridge road near forest boundary line. An escape from cultivation.

LAURACEAE

SASSAFRAS ALBIDUM (Nutt.) Nees. (*S. variifolium* (Salisb.) Ktze.). Sassafrass. Common throughout the forest, especially in the young reproduction stands, where it is sometimes the dominant species.

LINDERA BENZOIN (L.) Blume. (*Benzoin aestivale* (L.) Nees.). Spice Bush. Common along the streams and in moist places.

SAXIFRAGACEAE

HYDRANGEA ARBORESCENS L. Wild Hydrangea. Common on exposed road banks and other similar sites.

RIBES CYNOSBATI L. Prickly Gooseberry. Limited to the steep slopes below Coopers Rock.

RIBES SATIVUM Syme (*R. vulgare* Lam.) Garden Currant. Collected on the old Ryan farm only near the ranger station. This plant was left from past cultivation and is not native to the forest.

PHILADELPHUS CORONARIUS L. Mock-Orange. Not a native of the forest. Collected on the abandoned Ryan farm near the ranger station. Probably was at one time under cultivation.

HAMAMELIDACEAE

HAMAMELIS VIRGINIANA L. Witchhazel. Common in all parts of the forest under many site conditions.

PLATANACEAE

PLATANUS OCCIDENTALIS L. Sycamore. Found in moist places and along streams throughout the forest.

ROSACEAE

PHYSOCARPUS OPULIFOLIUS (L.) Maxim. Ninebark. Found only along Little Laurel Run and Cheat Lake.

MALUS CORONARIA (L.) Mill. (*Pyrus coronaria* L.) Wild Crabapple Found in thickets in most sections of the forest.

MALUS PUMILA L. (*Pyrus Malus* L.) Apple. A common plant in the forest that occurs in orchards and as an escape from cultivation.

ARONIA MELANOCARPA (Michx.). Ell. (*Pyrus melanocarpa* (Michx.) Willd.) Black Chokecherry. Found in swampy places and along streams in the forest.

ARONIA PRUNIFOLIA (Marsh.) Rehd. (*Pyrus arbutifolia* (L.) L.f.). Red Chokecherry. Found in a swampy area along Glade Run near Chestnut Ridge road.

AMELANCHIER ARBOREA (Michx. f.) Fern. (*A. canadensis* var. *Botryapium* (L.f.) (T.&G.). Downy Juneberry. Serviceberry. Common in all parts of the forest. Usually found along the streams and in moist sites.

AMELANCHIER SANGUINEA (Pursh) DC. (*A. spicata* (Lam.) K. Koch.). Roundleaf Juneberry. Found on the limestone outcrop below Coopers Rock.

AMELANCHIER LAEVIS Wieg. Smooth Juneberry. Found only at the Ryan farm near the ranger station and near the boundary line along the secondary road connecting Routes 319 and 73.

CRATAEGUS PEDICELLATA Sarg. Hawthorn. Common in thickets in most parts of the forest. This specimen was identified by E. J. Palmer of the Arnold Arboretum. Other unidentified species of Crataegus occur.

RUBUS L. (Species). Blackberries, Dewberries, Wineberries, Bristleberries. Rubus is one of the complex genera with many species being present in the forest. Over 500 species have been identified in the United States. No attempt has been made to identify species of this genus with the exception of raspberries.

RUBUS ODORATUS L. Purple Flowering Raspberry. Found in damp open areas near partial shade. Not very abundant.

RUBUS OCCIDENTALIS L. Black Raspberry. Common in thickets especially along roads and power line right-of-ways.

ROSA CAROLINA L. (*R. humilis* Marsh.). Low Pasture Rose. Not common but found in dry sterile soils in Darnell Hollow, below Coopers Rock and east of the archery course.

PRUNUS SEROTINA Ehrh. Black Cherry. Common thoughout the forest.

PRUNUS PENNSYLVANICA L. f. Fire Cherry. Bird Cherry. Found more commonly along the ridges on the rocky, dry soils.

PRUNUS AMERICANA Marsh. Wild Plum. Found throughout the forest but not common. Found in both cultivated and wild forms.

PRUNUS VIRGINIANA L. Chokecherry. Collected by H. A. Davis near the parking lot in Darnell Hollow.

PRUNUS PERSICA (L.) Batsch. Peach. Found on old abandoned farms. Not native. Probably the remains of old orchards.

PRUNUS AVIUM L. Sweet Cherry. Collected under wooded cover near the left fork of Little Laurel Run. An escape from cultivation.

PYRUS COMMUNIS L. Pear. One specimen was found on the old Ryan farm along the trail from the ranger station to Lick Run. Probably left from past cultivation.

LEGUMINOSAE

GYMNOCLADUS DIOICA (L.) K. Koch. Kentucky Coffee Tree. Found only along Cheat Lake below Coopers Rock. First noted by C. H. Baer.

GLEDITSIA TRIACANTHOS L. Honey-Locust. Found only along Quarry Run at Henry Clay Furnace.

CERCIS CANADENSIS L. Judas Tree. Redbud. Specimens were collected at the old CCC camp area and below Coopers Rock along the trail to the lake.

ROBINIA PSEUDO-ACACIA L. Black Locust. Common in the young reproduction stands throughout the forest.

RUTACEAE

XANTHOXYLUM AMERICANUM Mill. Toothachetree. Found along the limestone outcrop below Coopers Rock.

SIMAROUBACEAE

AILANTHUHS ALTISSIMA (Mill.). Swingle (*A. glandulosa* Desf.). Tree of Heaven. Established on the old Ryan farm near the ranger station. An escape from cultivation.

ANACARDIACEAE

RHUS TYPHINA L. Staghorn Sumac. Common in all areas of the forest.

RHUS GLABRA L. Smooth Sumac. Not as common as the preceding species but found throughout the forest.

RHUS COPALLINA L. Dwarf Sumac. Common in dry open habitats.

RHUS RADICANS L. (*R. toxicodendron* L.). Poison Ivy. Frequent along roads, old fence rows and at the edge of forest stands.

AQUIFOLIACEAE

ILEX VERTICILLATA (L.) Gray. Black Alder. Winterberry. Common in wet places and along streams.

ILEX MONTANA T. & G. (*I. monticola* Gray.). Mountain Holly. Found in damp sites and along the streams.

CELASTRACEAE

CELASTRUS SCANDENS L. Climbing Bittersweet. Common along the trail to Cheat Lake, below Coopers Rock, but limited elsewhere.

STAPHYLEACEAE

STAPHYLEA TRIFOLIA L. Bladdernut. Found only along the Coopers Rock trail to Cheat Lake trail.

ACERACEAE

ACER PENSYLVANICUM L. Striped Maple. Limited, but found in all parts of the forest.

ACER SPICATUM Lam. Mountain Maple. Found only near the mouth of Quarry Run. This is the first collection made of this species in Monongalia County.

ACER RUBRUM L. Red Maple. Very common in all parts of the forest.

ACER SACCHARUM Marsh. Sugar Maple. Common in moist rich soils throughout the forest.

HIPPOCASTANACEAE

AESCULUS OCTANDRA Marsh. Yellow Buckeye. Found only along the trail from Coopers Rock to Cheat Lake.

VITACEAE

PARTHENOCISSUS QUINQUEFOLIA (L.) Planch. (*Psedera quinquefolia* (L.). Greene). Virginia Creeper. Frequent in all parts of the forest.

VITIS AESTIVALIS Michx. Pigeon Grape. Collected along Chestnut Ridge Road between Route 73 and the Ranger Station.

VITIS AESTIVALIS var. ARGENTIFOLIA (Munson) Fern. (*V. bicolor* LeConte). Summer Grape. The most common grape found in the forest.

VITIS LABRUSCA L. Northern Fox Grape. Not common. Collected along Route 73 near Lick Run.

VITIS VULPINA L. (*V. cordifolia* Michx.). Frost Grape. Found along the trail from Coopers Rock to Cheat Lake, near the lake.

VITIS RIPARIA Michx. (*V. vulpina* L.). Riverbank Grape. Collected along Darnell Hollow road.

TILIACEAE

TILIA HETEROPHYLLA Vent. White Basswood. Found in most parts of the forest on moist banks and coves.

TILIA AMERICANA L. American Linden. Basswood. Found in moist soils throughout the forest.

MALVACEAE

HIBISCUS SYRIACUS L. Rose of Sharon. Found on the old Ryan farm near the ranger station. Not a native plant but probably at one time cultivated.

GUTTIFERAE

HYPERICUM SPATHULATUM (Spach.) Steud. (*H. prolificum* L.) Shrubby St. Johnswort. Not common but found in open fields and along roadsides.

NYSSACEAE

NYSSA SYLVATICA Marsh. Black Gum. Abundant. Found in most sections of the forest.

ARALIACEAE

ARALIA SPINOSA L. Hercules Club. Common in open areas in all parts of the forest.

CORNACEAE

CORNUS FLORIDA L. Flowering Dogwood. Common throughout the forest on dry soils.

CORNUS AMOMUM Mill. Silky Cornel. Kinnikinnik. Not common. Found along Cheat Lake and Sand Springs road in damp sites.

CORNUS RACEMOSA Lam. (*C. paniculata* L'Her.). Panicled Dogwood. Rare. Found along the trail from Coopers Rock to Cheat Lake and along Chestnut Ridge Road.

CORNUS ALTERNIFOLIA L. f. Alternate-leaved Dogwood. Found along Chestnut Ridge road and other open areas. Not common.

CLETHRACEAE

CLETHRA ACUMINATA Michx. White Alder. Collected by Jennings two miles south of Mont Chateau along the bed of Cheat river before the area was flooded.

ERICACEAE

RHODODENDRON MAXIMUM L. Rhododendron. Great Laurel. Common in moist rich soils and along forest covered streams.

RHODODENDRON ARBORESCENS (Pursh.) Torr. Smooth Azalea. Found along Little Laurel Run but doubtless grows elsewhere in the forest.

RHODODENDRON VISCOSUM (L.) Torr. Clammy Azalea. Common along streams and swampy areas.

RHODODENDRON NUDIFLORUM (L.) Torr. Pink Azalea. Present along roads and open woods in all parts of the forest.

RHODODENDRON CALENDULACEUM (Michx.) Torr. Flame Azalea. One specimen was found along the Chestnut Ridge road but it probably occurs elsewhere.

KALMIA LATIFOLIA L. Mountain Laurel. Little Laurel. Common on all types of soil but more abundant on dry acid soils in all parts of the forest.

LYONIA LIGUSTRINA (L.) DC. Maleberry. Collections were made in an open field along Glade Run near Chestnut Ridge road and along the trail from Coopers Rock road to Henry Clay Furnace.

OXYDENDRON ARBOREUM (L.) DC. Sourwood. On dry soils in all parts of the forest.

EPIGAEA REPENS L. Trailing Arbutus. Common on dry sandy soils. Especially abundant under the virgin hemlock on little Laurel Run.

GAULTHERIA PROCUMBENS L. Teaberry. Mountaintea. Spicy Wintergreen. Common in wooded areas throughout the forest.

GAYLUSSACIA BACCATA (Wang.) K. Koch. Black Huckleberry. Common along roads and open areas in all parts of the forest.

VACCINIUM STAMINEUM L. Deerberry. Found in wooded areas and along roadsides. Common.

VACCINIUM VACILLANS Torr. Late Low Blueberry. Abundant on the drier soils throughout the forest.

OLEACEAE

FRAXINUS AMERICANA L. White Ash. Common in rich moist soils in all parts of the forest.

FRAXINUS PENNSYLVANICA Marsh. Red Ash. Collected only along the trail from Coopers Rock to Cheat Lake.

RUBIACEAE

MITCHELLA REPENS L. Partridge Berry. Common under wooded cover in all parts of the forest. Especially under hemlock.

CAPRIFOLIACEAE

SYMPHORICARPUS ORBICULATUS Moench. Coralberry. One specimen was collected in a wooded area below the archery course.

VIBURNUM PRUNIFOLIUM L. Black Haw. Not common. Found only on the old Ryan farm near the ranger station and in Darnell Hollow.

VIBURNUM ACERIFOLIUM L. Mapleleaf Viburnum. Common throughout the forest.

VIBURNUM RECOGNITUM Fern. Arrowwood. Found only along Chestnut Ridge road and Sand Springs road.

VIBURNUM CASSINOIDES L. Wild Raisin. Frequent in moist places and along streams. Especially along Little Laurel Run.

VIBURNUM LENTAGO L. Nannyberry. Sheepberry. Found only in a damp site along Little Laurel Run adjacent to the virgin hemlock stand.

SAMBUCUS CANADENSIS L. Common Elder. Frequent in moist soils throughout the forest.

SAMBUCUS PUBENS Michx. (*S. racemosa* (L.). Red Elder. Collected along Sand Springs road. Not found in areas of low elevation.

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DEPARTMENT OF BOTANY INDIANA UNIVERSITY

New Plant Records for West Virginia

F. W. Hunnewell

I. The following plants which I have collected in West Virginia are not found in Core's Checklist. (**)

Carex Buxbaumi Wahlenb. Hampshire County.

Carex striatula Michx. Jefferson County.

Carex gracilescens Steud. Hardy County.

Stenanthium gramineum (Ker) Morong var. robustum (S. Wats) Fern. Hardy & Hampshire Counties.

Aconitum unicatum L. var. acutidens Fern. Randolph County.

Draba verna L. var. Boerhaavii Van Hall. Berkeley & Greenbrier Counties.

Baptisia tinctoria (L) R. Br. var. crebra Fern. Hampshire County.

Lathyrus palustris L. var. myrtifolius (Muhl.) Gray. Hampshire County.

Polygala polygama Walt. var. obtusa Chodat. Hampshire County.

Lonicera dioica L. var. glaucescens (Rydb.) Butters. Morgan County.

Eupatorium maculatum L. Randolph County.

Solidago uliginosa Nutt. Hampshire & Randolph Counties.

II. The following are new county records:

Glyceria acutiflora Torr. Greenbrier County.

Carex umbellata Schkuhr. Hardy County.

**Earl L. Core. A checklist of the Vascular Plants of West Virginia, following Gray's Manual of Botany, Eighth (Centennial) Edition. Mimeographed. West Virginia University, Morgantown, 1950.

CAREX HYSTRICINA Muhl. Greenbrier County.

MELANTHIUM HYBRIDUM Walt. Hampshire County.

CLINTONIA ALLEGHANIENSIS Harned. Greenbrier County.

CORALLORHIZA WISTERIANA Conrad. Pocahontas County.

HYDRANGEA ARBORESCENS L. var. OBLONGA T. & G. Hampshire County.

CRATAEGUS UNIFLORA Muenchh. Greenbrier County.

CRATAEGUS MARGARETTA Ashe. Greenbrier County.

CRATAEGUS SUCCULENTA Link. Greenbrier County.

SANGUISORBA CANADENSIS L. Hampshire County.

STYLOSANTHES RIPARIA Kearney . Greenbrier County.

CUSCUTA ROSTRATA Shuttlw. Randolph County.

MENTHA ARVENSIS L. var. VILLOSA (Benth) S. R. Stewart. f. GLABRATA (Benth.) S. R. Stewart. Hampshire County.

PRENANTHES TRIFOLIATA (Cass.) Fern. Pocahontas County.

WELLESLEY, MASS.

New or Unusual Forms of Ferns from Maryland and Pennsylvania*

CLYDE F. REED, PH.D.

In my travels through Maryland and Pennsylvania several forms of the various Eastern North American Ferns have come to my attention. Visits during the summer and early autumn of 1946 to the gardens of Mr. Richard C. Harlow at Laana, Pennsylvania and of Dr. Everett G. Logue at Williamsport, Pennsylvania, revealed several more interesting forms being cultivated in their gardens, the original specimens having been collected in nature. Some of these forms have been found since that time again in nature in other regions than those mentioned above, indicating that these forms are not wholly due to cultivation, but do occur as natural forms here and there. Some of them have been transplanted by Mr. Andrew Simon to Towson and to Blue Mount (Baltimore County), Maryland, where they have survived for the past five years, unchanged as to their external features.

Besides the specimens of these several forms from Maryland and Pennsylvania, there are in the Reed Herbaruim specimens of some of the forms from New York and Kentucky, which records are included here for distributional purposes. The following forms seem worthy of being named.

The first group of variations included those of the polymorphic Christmas Fern, *Polystichum acrostichoides*. Even though there have been many forms of the Christmas Fern named, herein are several forms which seem to be undescribed.

1. POLYSTICHUM ACROSTICHOIDES forma **demittens** Reed, form. nov.

   Pinnae steriles frondium simul compressae, demittentes. TYPE: *Reed 5454*, fertile frond, collected in Harlow's garden, July 21, 1946. Originally found by Harlow in the Pocono Mountains, Pennsylvania. Fig. 1.

This interesting form of the Christmas Fern is a large one, having fronds up to 24 inches in height. The lateral sterile pinnae are folded together along the main vein, so that only the underside of the pinna shows, and then all the pinnae hang downward, giving a 'drooping' aspect to the many fronds. This droopiness is not affected by ecological variations. The fronds have continued to come up this way for several years.

2. POLYSTICHUM ACROSTICHOIDES forma RECURVATUM Clute

There are several variations of the recurved type of Christmas Fern. The more normal types fit the original description by having

*The publication of this paper has been aided by a grant from the author.

Fig. 1. Polystichum acrostichoides forma demittens Reed, form. nov.: fig. 2. P. a. forma recurvatum Clute. fig. 3. Lycopodium complanatum var. flabelliforme forma recurvatum Reed, comb. nov.

the terminal third of the lateral pinnae folded together and recurved upward.

Maryland: *Baltimore Co.*, woods, southeast of Ashland Road Bridge, along the Gunpowder Falls, Dec. 28, 1946. *Reed 6400;* woods, about ten miles down-stream the Gunpowder Falls, southwest of Belair Road, Aug. 18, 1946. *Reed 5776;* wooded ravine, northwest of Gunpowder Falls and Hartford Road, Aug. 18, 1946. *Reed 5768; Garrett Co.*, on open meadow, 2 miles north of Gorman, Aug. 26, 1950. *Reed 21753.*

Kentucky: *Morgan Co.*, moist hillside along Wrigley-Paragon Road, near Wrigley, March 26, 1950. *Reed 18309.* Broun, in the Index to North American Ferns, page 146, gives the range as 'Connecticut to Virginia'. The above specimens from Kentucky extend the range of the form westward to that state.

Pennsylvania: Specimens from the garden of Mr. Harlow, who collected his specimens originally from the Poconos of northeastern Pennsylvania, near Laana, have the recurved lateral pinnae, but the terminal region is tasselled by several bifurcations, and occasionally the main axis forks also, as illustrated in Figure 2. Specimens collected July 21, 1946, *Reed 5453.* The tip simulates forma *cristatum* Clute (Fern Bull. 20: 81. 1912).

Not quite like forma *cristatum*, in which the tips of the fronds are divided and forked several times, but, in addition, with all the lateral pinnae likewise forked, are several specimens from Maryland and Pennsylvania.

a). On Wissahickon Schist soil, 1 mile north of Hereford, Baltimore Co., Maryland (Gunpowder Falls drainage). Originally collected here by Mr. Andrew Simon, Oct. 1948. Specimens obtained by Reed in May 1949 from the several specimens in Simon's garden at Towson, Maryland.

b). A specimen from rock woods at Rocks, Harford County, Maryland, collected by Reed, Nov. 3, 1946 (*Reed 6322*) has only the lateral pinnae forked two- to four-times.

c). Original plants collected in rocky woods along Little Pine Creek, near Waterville, Lycoming County, Pa., by Dr. Logue. Specimens collected in Sept. 1946, *Reed 5979*, in Logue's garden at Williamsport, Pa. Also *Reed 5974* was collected in the Logue garden.

All these specimens have cristate terminal fronds and lateral pinnae.

Fig. 4. Dennstaedtia punctilobula forma recurvata Reed, form. nov.; fig. 5. Dryopteris intermedia var. fructuosa forma furcata Reed, form. nov.; fig. 6. Dryopteris intermedia forma sparsifrondosa Reed, form. nov.

3. POLYSTICHUM ACROSTICHOIDES forma **spathiforme** Reed, form. nov.

Pinnae fertiles late spathiformes. TYPE: *Reed 5518*, two fertile, two sterile fronds, from rocky woods, at Peach Bottom, Lancaster County, Pa.

This form of the Christmas Fern has very broad spatulate fertile pinnae, the terminal region of the fertile frond being sterile, and looking very much like the sterile frond. The fertile pinnae vary from one half to two inches in length, about 19 pairs of fertile pinnae. The terminal quarter to half inch of each fertile pinna is broadened, making it spatulate in shape. The sterile pinnae on both the fertile and sterile fronds are very densely beset along the margin with sharp spines.

Additional localities and specimens in the Reed Herbarium are: Maryland: Baltimore Co., wet ravines along Manor Road, just north of Sweet Air. Feb. 18, 1951. *Reed 23587.*

New York: Orange Co., mountain side, along Route 6, just west of Slate Hill. March 25, 1951. *Reed 23690.*

Kentucky: Bell Co., wooded ravine along Route 21, near Crockett. July 2, 1947. *Reed 8073.* Rowan Co., rocky woods 2 miles west of Clack Mountain. Nov. 7, 1947. *Reed 10753.*

4. POLYSTICHUM ACROSTICHOIDES forma MULTIFIDUM Clute.

In passing, there is a correction which should be noted in Broun's Index to North American Ferns. On page 146, the citation for *P. acrostichoides* forma *multifidum* Clute reads 'Fern Bull. 15 (3): 71. 1907'. This should read—Fern Bull. 15: 72, with fig. on page 71. (1907), issued June 1908. The actual combination appears on page 72, not on page 71. The article begins on page 71.

A similar circumstance is found in the citation of forma *cristatum* Clute, in Broun, lit. cit. page 146, but this time Broun selects page 81 for the citation, which is the second page of the article, but happens to be the page on which the combination is proposed. This correction at least would make Broun's citations consistent and correct. As for the date of publication, it should read—issued June 1908.

Likewise, Fern Bull. 15 (4): for Oct. 1907 was issued Oct. 1908. Thus all citations from these two numbers of the Fern Bulletin should be corrected accordingly. Pertinent literature dealing with the issuance of the last two numbers of Volume 15 for 1907 are discussed in the following places in the Fern Bulletin. In Volume 16 (1): 28. 1908 mention is made that the last two issues for the preceding year are missing. Then, in the third number of Volume

16, issued in July 1908, page 92, the editor states, "The missing number of this magazine for October 1907 is partly in print at this writing, but it will not be sent out until the October number for this year is ready when the two will be sent together". This statement intimates that the first of the two missing issues had been sent and it turns out that it was sent out in June 1908. On page 95 in the 15th volume, part 3, for the year 1907 (July) is stated, "This number, together with the January, 1908, number recently issued, will be construed as completing the subscriptions of those who cease their subscription with 1907. The October issues for 1907 will be sent to all others as soon as out. Part of it is already in type as this is written". At the foot of page 96—"This number was issued June, 1908.'

5. DENNSTAEDTIA PUNCTILOBULA forma **recurvata** Reed, form. nov.

Pinnae frondium recurvatae. TYPE: *Reed 5509*. Fertile frond, collected from the original plant in the garden of Mr. Harlow, July 21, 1946. Original plant collected by Harlow in Lancaster Co., Pa. Fig. 4. In the summer of 1950 the fern was still doing well and had spread considerably.

This form of Hay-scented Fern was found in Pennsylvania. Some specimens were removed to the Harlow garden and cultivated there in very natural conditions. Later, Mr. Simon transplanted specimens to Towson, Maryland, where it is still doing fine. In this form the pinnae are recurved and give a 'droopy" appearance to the frond. The fronds do not change their form under varying ecological changes of sunlight or moisture. All the fronds continue to come up year after year in the same way.

6. DRYOPTERIS INTERMEDIA var. FRUCTUOSA forma **furcata** Reed, form. nov.

Apices frondis et pinnarum bifurcate vel plurifurcatae. TYPE: *Reed 5976*, sterile frond, collected from the original plant in the garden of Dr. Logue. Sept. 29, 1946. Fig. 5.

The late Mr. C. E. Weatherby wrote me in 1948 concerning this fern: ". . . it was collected long ago and has been grown for years by Mrs. F. B. Richards of South Lyndeboro, New Hampshire . . . ." I have been unable to find out whether Dr. Logue's plants came from Mrs. Richards' plant, or not. Mr. Weatherby also wrote me that Miss Kittredge has a crested form of the typical *intermedia*. The fullness of the form named above probably indicates that it is var. *fructuosa* of *Dryopteris intermedia*. In this form of the Ever-

green Woodfern the apical region of the frond as well as the ends of all the lateral pinnae are bifurcated one to three times.

7. DRYOPTERIS INTERMEDIA forma **sparsifrondosa** Reed, form. nov. Laminae pinnularum sparsifrondosae. TYPE: *Reed 5975*, fertile frond, collected in garden of Dr. Logue, Sept. 29, 1946. Fig. 6.

In this form of the typical *Dryopteris intermedia* the frond tissue is very sparsely distributed, especially in the upper fertile pinnules. Comparison of this form with nearly one hundred specimens of the Woodfern from eastern North America, shows the fertile regions of the fertile fronds to be definitely constricted and the frond tissue very sparse. The specimens were originally found in Pennsylvania by Dr. Logue, but no definite locality is given. The plants have continued to put up similar fronds each year.

8. ATHYRIUM FILIX-FEMINA var. ASPLENIOIDES forma **ellipticum** (Wherry) Reed, comb. nov. (*A. asplenioides* forma *ellipticum* Wherry, Amer. Fern Jour. 38 (4): 158, p. pl. 1948). Type locality: Talbott Co., Maryland, 2 miles south of Wye Mills.

9. DRYOPTERIS THELYPTERIS var. PUBESCENS forma **Haleana** (Fernald) Reed, comb. nov. (*Thelypteris palustris* var. *Haleana* Fernald, Rhodora 31: 34. 1929.) Florida to Louisiana and northward to southeastern Pennsylvania.

10. LYCOPODIUM COMPLANATUM var. FLABELLIFORME forma **recurvatum** (Reed) Reed, comb. nov. (*L. flabelliforme* forma *recurvatum* Reed, Castanea 12: 79. 1947.) Known in Maryland only, Baltimore Co., type locality. Still growing well in 1951. Fig. 3

Type of all new forms have been deposited in the United States National Herbarium, and duplicates and photos of the types have been retained in the Reed Herbarium.

REED HERBARIUM,
HARFORD AND CUB HILL ROAD,
BALTIMORE 4, MARYLAND.

NOTES and NEWS

Presenting Southern Appalachian Botanists; Brief Sketches of South Carolina Botanists

Associated with Department of Botany and Bacteriology, Clemson College, Clemson, South Carolina

Armstrong, G. M. Head of Department. B.S., Clemson College. M.A., U. of Wisconsin. Ph.D., Washington U. (St. Louis). Came to Clemson, 1924. Duties: Teaching and research. Research interests: *Fusarium* wilts. Research recently completed: Biological races of the *Fusarium* causing wilt of cowpeas and soybeans. Research soon to be completed: *Fusarium* wilt of *Crotalaria*.

Arndt, C. H. Plant Pathologist. A. B., Lebanon Valley College. M.S., Purdue U., Ph.D., U. of Pennsylvania. Came to Clemson, 1930. Duties: Research. Research interests: Fungicides for seed treatment and the physiological aspects of seedling diseases. Research recently completed: Treatment of cottonseed. Research soon to be completed: Temperature relations of the diseases of the cotton seedling.

Petersen, D. H. Plant pathologist. B. S. and M. S., Michigan State College. Came to Clemson, 1950. Duties: research. Research interests: Mycology, morphology, physiology, and taxonomy of fungi causing physiologic responses in deciduous fruit. Research soon to be completed: Host and pathological relationships of *Glomerella cingulata* and peach and lupine (*Lupinus angustifolius*).

Rosenkrans, D. B. Professor, A.B., Upper Iowa U. M.S., U. of Wisconsin. Came to Clemson, 1913. Duties: Teaching general botany, histology, and plant physiology. In charge general botany.

Rutledge, R. W. Assoc. Professor. A.B., Union U., Tenn. M.A., Peabody College. Ph.D., U. of Chicago. Came to Clemson, 1946. Duties: Teaching general botany, morphology, and ecology. Research interests: Morphology, ecological anatomy, improvement of teaching.

Whitney, J. B. Assoc. Professor. B.S., U. of Georgia. M.S., N.C. State College. Ph.D., Ohio State U. Came to Clemson, 1946. Duties: Teaching general botany and plant physiology. Research interests: Water relations of plants. Biosynthesis of vitamins.

Associated with Department of Biology, Furman University, Greenville, South Carolina

Christenberry, G. A. Dean of Men's College and Professor. B.S., Fruman U. M.A. and Ph.D., U. of North Carolina. Came to Furman, 1943. Duties: Administration and teaching. Research interests: Mycology. Research recently completed: Mucorales of Greenville County, South Carolina.

Williams, L. G. Assoc. Professor. A.B., Marshall College, W.Va. M.A. and Ph.D., Duke U. Came to Furman, 1948. Duties: Teaching biology, botany, human anatomy, and physiology. Research interests: Marine biology. Research recently completed: Three papers on marine life in North Carolina.

Associated with Department of Biology, Coker College Hartsville, South Carolina

Matthews, Velma D. Professor and Head of Department. A.B., Woman's College, U. of North Carolina. M.A. and Ph.D., U. of North Carolina. Came to Coker College, 1934. Duties: Teaching botany, biology and zoology. Research interests: Fungi, ferns, native southern plants, camellias. Research recently completed: Papers on Camellias.

Associated with Department of Biology and Pharmacognosy, Medical College of South Carolina, Charleston, South Carolina

Larisey, Mary M. Asst. Professor. A.B., M.S., and Ph.D., Washington U. (St. Louis). Came to Medical College, 1947. Duties: Teaching general botany, plant anatomy, general zoology. Research interests: Taxonomy of flowering plants.

Associated with Department of Biology, Winthrop College, Rock Hill, South Carolina

Schuchart, Mary. Assist. Professor. A.B., Kansas U. M.A., Columbia U. Came to Winthrop, 1928. Duties: Teaching botany and bacteriology.

Associated with Edisto Experiment Station, Blackville, South Carolina

Hughes, M. B. Assoc. Horticulturist. B.S., Michigan State College. Ph.D., U. of California (Berkeley). Came to Experiment Station, 1945. Duties: Research. Research recently completed: Self-incompatability in *Crepis foetida* subsp. *rhoedifolia*. Research soon to be completed: Self-incompatibility in *Ipomoea batatas*.—WILBUR H. DUNCAN, UNIVERSITY OF GEORGIA.

CONCERNING SOME 1947 PLANT COLLECTIONS—SILPHIUM RENIFORME Raf. This infrequently collected plant was found at the summit of Warm Springs Mt., State Highway 39, Bath County ,Virginia, July 21.

FILIPENDULA RUBRA (Hill) Robinson. A very ornamental plant when abundant in meadows as was the case near Millboro, Bath County Virginia, on July 18.

STACHYS GERMANICA L. I was surprised to find this European weed well established one mile east of Blue Bend, Monongahela National Forest, Greenbrier County, West Virginia July 20.

QUERCUS MACROCARPA Michx. There are many large trees of this oak along the Shenandoah River near Millville, Jefferson County, West Virginia. Specimens were collected October 18. This group of trees appears to be natural and not an escape from cultivation.

THUJA OCCIDENTALIS L. Abundant on limestone cliffs 1¼ miles west of Shárpsburg, Washington County, Maryland. Specimen collected October 25.

AMPHICARPA BRACTEATA var. COMOSA (L.) Fern. This plant normally has two types of pods. Those on the upper parts of the plant are from the normal flowers; those on long slender stems are formed from apetalous flowers and develop in the leaf mold or soil near the plant. These ground-developed pods are nearly round and contain a single large seed instead of the 2 to 4 smaller seeds found in the aerial pods. On October 4 several plants were found producing typical one-seeded pods from apetalous flowers 5 to 7 feet above ground. Botanical collections of these were made along the Chesapeake and Ohio Canal one mile below Potomac River Dam No. 4, Washington County, Maryland.

Specimens of the plants named above have been deposited in the Herbarium of the National Arboretum, Washington, D.C.

OLIVER M. FREEMAN
TRYON, N.C.

PRESIDENT'S WATER RESOURCES POLICY COMMISSION REPORT COMPLETED—The President's Water Resources Policy Commission, which was appointed in January, 1950, to study and make recommendations on policies in the field of water resources, together with existing legislation, has just released to the public the last of its three-volume report and having completed its assignment has gone out of business, Chairman Morris L. Cooke announced on February 26.

The Commission's main report, volume 1 entitled "A Water Policy for the American People," offers a coordinated national pro-

gram for the development of water resources, together with specific recommendation on policy. Volume 2, "Ten Rivers in America's Future," is a study of 10 river basins in different parts of the country and includes a detailed discussion of the problems of each basin with a mass of pertinent material never heretofore published. Each of these basin studies has been published as a separate. The third volume, "Water Resources Law," summarizes Federal law concerned with the nation's water resources. Copies of each volume may be purchased from the Superintendent of Documents, Washington 25, D.C.

Bogs of the Southern Appalachians—Two recent articles contain information relative to bogs of the southeastern States. In a paper entitled "Radiocarbon Dates" (Science 113: 111-120, 1951) J. R. Arnold and W. F. Libby give ages in years of samples of peat from Cranberry Glades, West Virginia, and Singletary Lake, North Carolina, while George B. Rigg, in an article "The Development of Sphagnum Bogs in North America. II" (Botanical Review 17: 109-131, 1951) discusses the formation of bogs in West Virginia, Florida, Texas, Louisiana, Alabama, North Carolina, and Tennessee, with especial emphasis on Cranberry Glades.

Spring Wild Flower Pilgrimage—The First Spring Wild Flower Pilgrimage in the Great Smoky Mountains National Park was held on April 27, 28, and 29, with headquarters at Gatlinburg, Tenn. During the month of April more than 200 wildflowers have been found in bloom along the trails and streams of the park. Altitudes range 5,800 feet from the highest to the lowest elevations in the park and botanists have listed some 1,300 species of flowering plants, 1,800 kinds of fungi, 330 mosses and liverworts and 230 lichens. A feature of the program was a color movie by H. P. Sturm, Clarksburg, West Virginia, "Wildflowers of the Alleghenies." It is to be hoped that the Pilgrimage will become an annual affair.

Proposed Checklist of Southeastern Plants—There is a definite need to have the binomials of the plants of the southeastern United States in accord with nomenclature generally recognized elsewhere. While many of Small's generic concepts are accepted as they stand, some of them are interpreted otherwise by recent students.

At an informal meeting in Knoxville in 1949 a group of southeastern botanists discussed this problem. In the light of the fact that Small's Manual of the Southeastern Flora is not likely to be revised and that several state floras which should have uniformity of nomenclature are in preparation, it was felt that steps might be taken

to avoid duplicate efforts. It was the opinion of the group that a revised list of binomials of plants in the Small's Manual area made largely in conformity with those in Gray's Manual would be of much practical value.

This group of botanists was composed of A. J. Sharp, University of Tennessee, W. H. Duncan, University of Georgia, E. L. Core, West Virginia University, R. K. Godfrey and Wm. B. Fox of North Carolina State College, A. B. Massey, Virginia Polytechnic Institute, E. S. Ford and Lillian E. Arnold, University of Florida. Miss Arnold was appointed secretary and instructed to write various taxonomists, both for comments on the proposed effort and to ask them to prepare lists of revised names of plants in groups of their particular interest occurring in the Small's Manual area.

At a meeting of the same group in Charlottesville, Virginia in 1950, the secretary reported interest and encouragement of the proposed project by numerous taxonomists, and also reported the receipt of revised binomials submitted by 21 people. Discussion of publication of the lists raised two possibilities: (1) publication of the installments as received over a period of years in some journal such as Castanea, or (2) publication of one complete list as a special issue of some journal financed in part from private funds.

More volunteers are needed to revise the names in various families of plants. Botanists interested in this work are urged to correspond with some member in the group to discuss what they can contribute to this project, and to offer criticisms.—Lillian E. Arnold, University of Florida, Gainesville.

Foray at Tuscaloosa—On April 21 members of the Southern Appalachian Botanical Club and other botanists attending the meeting of the Association of Southeastern Biologists at Tuscaloosa made a foray along the Black Warrior River under the leadership of Dr. R. M. Harper. Interesting plants noted on the trip included *Prunus umbellata, Hydrangea quercifolia, Aesculus pavia, Asarum arifolium, Trillium stamineum, Aster camptosorus, Erythronium rostratum, Dentaria multifida, Arisaema quinatum, Philadelphus sp., Cladrastis lutea, Acer leucoderme, Carex crebriflora, Bignonia capreolata, Crataegus sphacelata, Ulmus alata, Sedum nevii, Isopyrum biternatum, Arundinaria macrosperma* and *Neviusia alabamensis.*

HENRY BLAIR GRAYBILL was born on Oct. 22, 1880, in Amsterdam, Virginia, the son of a physician. After the death of his parents, he was brought, at the age of three years, to live with relatives in Lewisburg, West Virginia. Having prepared for college in the school which later developed into the Greenbrier Military School, he entered Washington and Lee University and was graduated, in due course, with the class of 1902.

After teaching one year at Fishburn Military School in Waynesboro, Va., Mr. Graybill joined the staff of the Canton Christian College in Canton, China, where he not only taught, but also assisted in buying land and putting up the first buildings for that institution.

On his first furlough in the United States, he studied at Columbia University and earned the M.A. degree.

Thereafter he remained in the service of the college at Canton (now Lingnan University) in the various capacities of Acting President, Principal of Middle School, and Professor of Education, until 1926. A major contribution made by Mr. Graybill to Christian education in China was the writing of a series of six books for the study of the English language by Chinese students. The series is entitled *Mastery of English*. It has been used in all parts of China. Ginn and Co. published a Civics Reader, *The New China*, also written by Mr. Graybill.

Returning to the United States in 1926, Mr. Graybill settled in Lewisburg, his old home. For the year 1926-1927 he was a member of the staffs of both Greenbrier College and the Greenbrier Military School. From 1927 until his death, he remained at Greenbrier College, and, at the time of his death, was serving as Professor of Psychology and History.

Soon after his return to Lewisburg, he was elected an Elder of the Old Stone Church on which office he remained continuously. He was long actively associated with Boy Scout work in the district in which he lived. At the time of his passing he was First Vice-President of the West Virginia Historical Society.

Among his somewhat wide interests was a vital one in the outdoor world, and he had, with long patience and investigation, prepared a check list of the wild flowers of Greenbrier County. On April 4, 1951, he met his classes as usual. In the late afternoon, while advising a younger friend about removing some roots of Chinese

bamboo from the abundant growth at his own home, he passed away, among the growing things in which he had always taken much delight.

Besides his wife, whom he married in 1909, a son and two daughters survive him, with seven grandchildren.

JOSEPH E. HARNED—Dr. Joseph Edward Harned, pharmacist and botanist of Oakland, Md., died on May 5, 1951, after an illness of 3 weeks. He is survived by a son, Harold H. Harned, of Oakland, and a daughter, Mrs. Hubert K. Burdette, of Mt. Airy, Md.

Dr. Harned was born near Oakland on December 1, 1870, a son of John and Anna Davis Harned. He was a graduate of the Philadelphia College of Pharmacy and practiced pharmacy for 60 years, all but two of which were spent at Oakland. He held honorary doctor of science degrees from West Virginia Wesleyan and Western Maryland Colleges. He was a member of the American Association for the Advancement of Science, the Botanical Society of America, the Southern Appalachian Botanical Club and other scientific organizations.

Dr. Harned was a member of Oakland Lodge No. 192, A. F. and A. Masons, Garrett Lodge No. 113, Knights of Pythias, and a charter member of the Oakland Rotary Club. He was also a member of the Order of Eastern Star and a past patron. He was a trustee of St. Paul's Methodist Church and had taught a Sunday School class for 50 years. During Oakland's Centennial celebration in 1949 he was selected as the man of the older generation to pass the torch, with all the noble traditions of the county, down to the younger generation.

His fame as a botanist was due chiefly to his book, "Wild Flowers of the Alleghanies", which first appeared in 1931. The book was the outgrowth of years of study in a hobby which he began to cultivate while still a lad. It includes a vast wealth of information dealing with plant distribution in the Alleghany Mountains, in addition to providing concise descriptions of numerous species. Numerous illustrations appear, most of them line drawings, but there are a few color plates and several photographs.

Besides adding greatly to known distributional data of Alleghany wild flowers, Dr. Harned's investigations brought to light at least two species new to science, namely *Clintonia alleghaniensis* Harned and *Eupatorium Harnedii* Steele.

His work brought recognition in many ways. He was invited to speak before numerous national groups, including the National Geographic Society in Washington. On September 4, 1950, he addressed a dinner meeting of the Northeastern Section of the Botanical Society of America and of the Southern Appalachian Botanical Club, held in his honor at Oakland. A 1600-foot color film, with a sound track narrative, "Wild Flowers of the Alleghanies", made in 1948 by H. P. Sturm, of Clarksburg, W. Va., was dedicated to him.

The following appraisal is an excerpt from an account written several years ago by Dale Carnegie and read during the funeral service:

"His love for wild flowers has never deserted him. Sundays he tramped the flatlands of Maryland; he took trips into the mountains; he studied the wild flowers with breathless consuming interest. One day an idea stole into his mind as softly as a jack-in-the-pulpit pushing through the leaf mold. He would write a book on wild flowers. So he intensified his study. Finally the book was finished. He called it 'Wild Flowers of the Alleghanies'. A monumental book, superbly illustrated. One of the finest books ever written on wild flowers in the United States.

"Meantime Dr. Joseph E. Harned keeps right on running his pharmacy. In addition he goes out and makes speeches on wild flowers to schools and clubs. He wants to share his hobby every day with the public, so he places a vase of wild flowers on the counter of his store. Now and then some one asks him about the flowers. He is delighted. A smile comes into his face, his eyes take on a bright, shining light. Yes, indeed, Joseph E. Harned has one of the loveliest, most satisfying hobbies in all the world. He is a happy man because he has an enthusiasm for something beautiful outside himself. Something he can share with others."

Those who were the most closely associated with this modest botanist appreciate most clearly the true greatness of the man.—EARL L. CORE.

BOOK REVIEWS

A New Book on the Hydnaceae—This taxonomic volume fills a need which has been felt for many years. Since Banker's monograph appeared in 1906 little has been published on the Hydnaceae until the present volume. It is based partially on a number of articles written by the senior author and on his study of these fungi over a period of more than 30 years.

The nomenclature is much the same as that used by Banker. The authors do not agree with some of the more recently proposed changes, one of which would combine the genera Hydnella and Phellodon under Calodon, a genus which is not recognized in this volume. In the area covered, the authors recognize ten genera, including a new genus, Bankera. The genera include 60 species, one variety and two forms. Two species are described as new and three new combinations are made. The largest genera are Hydnellum, consisting of 20 species and one form, Sarcodon, with 13 species and Phellodon with ten.

The keys are conveniently arranged. They consist of separate keys to genera and to species, as well as a key to species for each genus. Much weight is rightfully placed on spore characteristics. The descriptions are apparently complete and adequate for recognition. Some information is given as to general habitat and distribution. A list of additional illustrations is also included.

The volume consists of 89 pages of text, 53 full-page half-tone plates and seven plates of line drawings of microscopic details. The illustrations are excellent and should be an invaluable aid in identification. The price is not prohibitive.

The book is intended to be purely taxonomic and the reader who may anticipate more lengthy discussions of the distribution, the role and importance of these fungi in their particular habitats, and perhaps something of their growth in nature or in pure culture will be disappointed. Apparently too little is known at present to discuss these subjects. Speaking of distribution the authors state: "It seems clear from our experience that aside from broad bands of climate and striking soil characters, nothing is known so far other than that cold or moderate temperature and fertile forest areas are best liked by these fungi."

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*The Stipitate Hydnums of the Eastern United States. William Chambers Coker and Alma Holland Beers. The University of North Carolina Press, Chapel Hill. 1951. 211 pp. $5.00.

This book is well worthy of a place beside the other taxonomic volumes by Dr. Coker and his colleagues and the taxonomic mycologist will find frequent use for it.—H. L. Barnett, West Virginia University, Morgantown.

An Accurate Wild Flower Guide[1]—For a long time I have been looking for a beginners' guide to wild flowers which could be generally recommended as both informative and accurate. Two books of this type which have appeared during the past year or two proved to contain too many errors to be satisfactory, as pointed out in reviews in Castanea. Now, however, one has come to hand which is an excellent example of how information on plants should be presented to the beginner, and deserves to be called to the attention of teachers by a favorable review. It is a slim 8 by 10-inch picture book, containing superb illustrations and accurate characterizations of 50 flowers, chiefly natives of the northeastern and midland states, the few which are introduced being clearly and correctly so designated. Of these, 20 have the names set beside the illustrations, while 30 are assigned a number and in the text are discussed by cleverly worded questions, their identities being then disclosed in an index on the final page. Many of the species have their pollinating insects painted in, and these too are correct. Altogether it is a most creditable piece of work, and merits the highest praise.—Edgar T. Wherry, University of Pennsylvania.

An Introduction to the Anatomy of Seed Plants[2] by Ernest L. Stover of Eastern Illinois State College is a welcome addition to the present limited number of textbooks of plant anatomy. It represents an innovation over other texts currently in use in that it emphasizes the developmental point of view.

The subject is introduced by a study of the seed, including both Gymnosperm and Angiosperm seeds, and of the developing embryo within. Germination studies of the various types of seeds give excellent examples of different types of seedlings, with opportunity to observe the renewed growth of the embryo and its subsequent development into the seedling. Not only external but also internal anatomy is studied. The development of tissues in each of the

[1] What Wildflower Is It? Anna Pistorius. Chicago-New York: Wilcox & Follett Co. 1950. $1.25.

[2] An Introduction to the Anatomy of Seed Plants. Ernest L. Stover. Boston: D. C. Heath and Company. 1951. $4.00.

vegetative organs, viz, roots, stems, and leaves, is followed through from initiation to maturity. More than usual attention is paid to the opening of buds and the early development of leaves, without sacrificing any treatment of characters associated chiefly with mature leaves, such as epidermal appendages and the phenomenon of leaf fall. Some changes in structure brought about by varying environmental factors are featured.

The chapter on vegetative propagation is highly informative and should be of practical value not only to horticulturists and florists but to the home gardener as well. The last three chapters deal with wood and include a key to the woods commonly found and used in the United States. They should be of general and cultural interest to all students of plant anatomy.

The book contains approximately 288 pages with many excellent and well chosen illustrations. The author is to be commended for the use of native or commonly found introduced plants as selections for study instead of some rare, tropical, or otherwise unavailable or unfamiliar material as is frequently found in textbooks.

To this reviewer, the method of presentation of subject matter employed by the author of a plant from the embryo through the seedling stage on to maturity should prove a fascinating and worthwhile study to any student of botany.—NELLE AMMONS, WEST VIRGINIA UNIVERSITY.

THE REVISED GRASS MANUAL[1]—Botanists welcomed the appearance early this year of the second edition of the "Grass Manual", both because of the many revisions contained in this book, and because the first edition has been long out of print. This new edition, revised by Agnes Chase, long associated with Dr. Hitchcock, the original author, has the same format and general appearance as the first edition[2] and bears the same evidence of the highest type of scholarship.

Despite the fact that the first edition represented the fruits of virtually a lifetime of work on the part of Dr. Hitchcock, the new edition includes a very considerable addition to the total number of genera and species described. In the first edition 159 genera and 1100 species were included, whereas in the second edition 169 genera

[1]Manual of the Grasses of the United States. A. S. Hitchcock. 2nd ed. Rev. by Agnes Chase. U.S.D.A. Misc. Publ. No. 200. 1051 p. Government Printing Office, Washington, D.C. $3.00. February 1951.

[2]Manual of the Grasses of the United States. A. S. Hitchcock. U.S.D.A. Misc. Publ. No. 200. 1040 p. Government Printing Office, Washington, D.C. 1935.

and 1398 species were included. Furthermore, the examinations of many collections, some of them made under the stimulus of the discovery of a plant not reported for a given area "by Hitchcock", has resulted in a vast number of additional state records on the distribution maps. Specimens in the grass collection of the United States National Museum alone increased in number from 210,000 in 1935 to 320,000 in 1950.

The illustrations have also undergone revision and additions have been made, although a change in the system of numbering the figures does not allow a quick contrast between the two editions in this respect.

The work of Mrs. Chase deserves recognition of a most marked sort. That after a long period of association with the original author she was able, after his death to continue the studies and bring out a revised edition when she had passed her 81st birthday, is an achievement of unusual distinction. First appointed as agrostology artist at the United States Department of Agriculture in 1903, she continued work with grasses, as assistant systematic agrostologist, assistant botanist, associate botanist, and senior botanist, and was appointed custodian of grasses at the National Museum in 1939, at an age when most people are ready for retirement. It is most fitting that she should leave this new book as a monument to a half-century of tireless research.—EARL L. CORE, WEST VIRGINIA UNIVERSITY.

Reprints should be ordered when galley proof is returned to the editor. Morgantown Printing & Binding Co., Morgantown, W. Va., have furnished the following rates:

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